



TELECOPIER COVER SHEET

1(c)(d)(e)

CANTON DROP FORGE

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: GENE HILLFIRM: HAMMONTRUB

CITY: _____

PHONE: () FAX: ()FROM - NAME: KEITH HOLDSWORTHFIRM: CANTON DROP FORGECITY: CANTON, OHIOTOTAL NUMBER OF PAGES 7 INCLUDING COVER SHEET.

WE ARE TRANSMITTING ON THE FOLLOWING:

DATE: 3/13/96TIME: 4:00

IF YOU DO NOT RECEIVE ALL PAGES - PLEASE CALL BACK AS SOON AS POSSIBLE.

TELEPHONE: (216) 477-4511, EXT. 180

- =====
- ① WORKMAN INVOICE - BEING HELD
 - ② MACK COVER SHEET - THE DAY THEY ASKED ABOUT THE OIL
 - ③ PERLESS INS. - PERFORMANCE BOND
 - ④ ITEMS 1-59 - THE GROWING LIST OF PROBLEMS

WHAT SHOULD BE DONE W/ ITEM #3 I HAVE THE ORIGINAL. SHOULD ITEM #1 BE HELD OR NOT?

CDF005852



320 Tallmadge Road • Kent, Ohio 44240
Phone (216) 678-7002 • FAX (216) 678-7322

INVOICE

1 (c)(d)(e)

INVOICE #: 3848 PG 1
INVOICE DATE: 02/08/96
OUR JOB NO: 454

HAMMONTREE & ASSOCIATES, LTD
5233 STONEHAM ROAD
NORTH CANTON, OH 44720

JOB: CANTON DROP FORGE
PHASE ONE

ATTN: ACCOUNTS PAYABLE

Quantity	Unit	Description	Unit Price	Ext Price
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02/08/96 PROGRESS BILLING
CANTON DROP FORGE PHASE 1

ITEM 4.1
120 GPM OIL/WATER SEPARATION YARD
SYSTEM - COMPLETE
MATERIALS AND LABOR

46,369.00

Handwritten: HOD
K57
2/13/96

ACCOUNT DISTRIBUTION

Reg. No.

CDF005853

Genl. Acct.	Plant	Dept.	Cost Center	Machine No.	Factory Account	Freight Prov.	Invoice Amount
131							
131							
131							

SUBTOTAL CHARGE 46,369.00

LESS RETAINAGE WITHHELD 4,636.90
LESS PREVIOUS PAYMENTS

AMOUNT DUE THIS INVOICE *Bz* 41,732.10



TELECOPIER COVER SHEET

1(c)(d)(e)

CANTON DROP FORGE

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: MARK ANDRUKAT

FIRM: MACK INDUSTRIES

CITY: _____

PHONE: () FAX: ()

FROM - NAME: KEITH HOUSENBACH

FIRM: CANTON DROP FORGE

CITY: CANTON, OHIO

TOTAL NUMBER OF PAGES 7 INCLUDING COVER SHEET.

WE ARE TRANSMITTING ON THE FOLLOWING:

DATE: 3/6

TIME: 9:25

IF YOU DO NOT RECEIVE ALL PAGES - PLEASE CALL BACK AS SOON AS POSSIBLE.

TELEPHONE: (216) 477-4511, EXT. _____

=====

MSDS ES 13640
ES 13557

CDF005854

GENERAL STATUS INQUIRY CONTRACT BONDS

Peerless Insurance

Member The Netherlands
Insurance Companies



☒ Peerless Insurance Company

☐ The Netherlands Insurance Company

62 Maple Avenue
Keene, New Hampshire 03431

CANTON DROP FORGE
4575 SOUTHWAY SW
CANTON, OH 44706

DATE: 1/02/96

BOND NUMBER: 18-798974

Contractor WORKMAN INDUSTRIAL SERVICES INC		Address 320 TALLMADGE ROAD; KENT	
Obligee CANTON DROP FORGE		Address 4575 SOUTHWAY SW; CANTON	
Description of Contract - Include Location and Owner's Contract Number BID/PERF IND PRETREAT SYSTEM			
Contract Price \$ 130,879.00	Bond Amount \$ 130,879	Effective Date 10/02/95	

The following information will be treated in strict confidence and accepted without prejudicing your right or affecting our liability under the above bond. Your cooperation in furnishing us with as much of the following information as is now available is appreciated.

Sincerely,

By Sandra Calhoun

1. If Contract Complete, Please State

Approximate Date of Completion	Approximate Acceptance Date	Final Contract Price Including Retainage \$
--------------------------------	-----------------------------	--

2. If Contract Uncomplete, Please State

Amount of Contract Completed - Including Retainage \$	Percentage of Retainage Withheld %	Probable Date of Completion
--	---------------------------------------	-----------------------------

3. Date of Last Estimate _____ Contract on Schedule? _____

4. Do You Know of Any Unpaid bills for Labor or Material? _____

5. Length of Maintenance Period, If Any _____

6. Remarks _____

It is understood that the information contained herein is furnished as a matter of courtesy for the confidential use of the surety and is merely an expression of opinion. It is also agreed that in furnishing this information, no guaranty or warranty of accuracy or correctness is made and no responsibility is assumed as a result of reliance by the surety, whether such information is furnished by the owner or by an architect or engineer as the agent of the owner.

Owner _____

Signed _____

Title _____

Date _____

The language of this form is acceptable to the Surety Association of America.

This is a list of concerns regarding the oil water separator and the grease trap.

1. The system failed on the night it was installed. This failure may have been high water. A float or a pump may have malfunctioned. With in one week a pump failed and as of 2/13 the pump has not been returned to service. (PUMP REPLACED ON 3/1)
2. The pump control panel on the separator is splitting apart at the lower seam. Water is running out of the control panel as condensation collects on the cold walls and componets.
3. A high oil level switch is in place but is not connected to the control circuit. (CONNECTED AS OF 3/1)
4. The float switches used inside the separator contain mercury. It should be our objective to get rid of mercury rather than install new equipment containing mercury.
5. Are the stainless steel cables in place for hoisting out the pumps? (THE CABLES ARE IN PLACE)
6. The motors M1 & M2 should be marked on the print and on the lines leading from the pumps.
7. It is not reasonable to allow large globs of oil to escape the system and collect on the water over the pumps.
8. It is not reasonable to remove oil from the area over the filters only by hand.
9. It is not reasonable to collect large volumes of water in the oil storage chamber when the skimmer feature is operating continuously. (AS OF 3/7/96 THE WATER LEVEL OVER THE COALESCER TUBES IS SO HIGH THAT THE OIL STORAGE CHAMBER FILLS TO CAPACITY WITHIN FOUR HOURS WITH THE OPENING IN THE ROTARY PIPE SKIMMER STRAIGHT UP. THE FLOW SEEMS TO BE STEADY AT ABOUT 50 GPM.)
10. It is not reasonable to clean the oil filters more than once in 6 months. It was indicated that they might have to be cleaned every few weeks. (THEY WERE CLEANED ON FRI. 3/1 AND ON MONDAY 3/4 THE OIL STORAGE CHAMBER WAS FULL OF WATER BY 8:00.)
11. Bollards still need to be placed around the grit tank and separator.
12. A drawing of the grit tank should be supplied.
13. Page 8 what is the contract #.

14. Page 19 where is Fig. 1.0? Fig 1.0 on page 15 is not it.
15. Page 20 inlet chamber not labled.
where is the inlet sludge/diffusion baffle?
separating chamber not labled
sludge chamber is not labled
16. Why is the vertical tube support shown as extending to the work platform? (I AM NOT PROPOSING THAT THIS WOULD BE A GOOD FEATURE.)
17. Page 23 implies that if flow rates are within spec. the rotary pipe can be used in an "automatic" mode.
Is OUTLET really OVERFLOW
which part names should my people use?
18. Page 24 where is our model number?
19. Page 19 nomenclature is a big problem
how do you check the slugde depth?
20. Page 30 nomenclature problems.
21. Page 32 another Figure 1.0 but still not the one.
22. ~~total P.03 electrical schematic is not right for our system. Wire numbers? Part numbers? Power house control panel? What do we do if one pump is out and alternating feature can not be used?~~
23. What spare parts should be on hand?
24. Page 6 of pump manual-why is our float at 8" if 10" is recommended?
is RPM 1750 as in the manual or 1550 as on the drawing?
25. Has the start up report been completed? Where is my copy? Insulation test?
26. I would like to have the information on page 18 filled out for each pump. We have lost tags in the past.
27. Has the warranty registration card been sent in?
28. Is the 2" sludge drawoff to have a KAM-LOK with cover? Per oilsep drawing dated 8-24-95? Not having the junction box in the separator may be the reason moisture is collecting in the control panel. Electrical conduit?
29. Is 1' 6" still correct on drawing TTRAP 8/25/95 for the oil retention depth? This is about 291 gallons of oil (5.3 drums)

30. I would like to have updated reproducible drawings and a disk with the CAD information for future reference.
31. Water samples need to be collected and analyzed to show that the system is working as specified. (AS OF 3/7 LARGE GLOBS OF OIL ARE STILL ENTERING THE PUMP AREA. THIS IS WAY TOO MUCH OIL.)
32. The oil that is passing to the pumps may be enough to harm the pumps when the oil thickness becomes too great. Mark Andrukat is aware of this possibility. As of 3/6 both pumps are coming on every time the system pumps. Mark said this could mean that one of the pumps has failed. This is an odd way to find out that you have a pump problem.
33. The tubes were cleaned and the sludge was drawn off the bottom on 3/1. Material on the bottom may have been scale from the water. It looked like sand but it seemed to be soft as it would break down when compressed.
34. The hand rail was installed on 3/1. The bottom rail is at about 20" and the top rail is at about 44".
35. The "over flow pipe with tee" is oil covered. Oil and water have been going to the pond. This should only be clean oil free water but with oil passing into the pump chamber oil will go to the pond.
36. Mack has very little experience with this brand of separator. This is a new type of installation. This oil may not be compatible with coalescers. North Coast didn't give Mack any indication as to the type of oil. I sent the MSDS to Mack on 3/6.
37. 3/7 Thur. "Lead Pump On" and "Lag Pump On" floats were very close to the same elevation. The lag pump never came on when I raised the lead pump float. Are leads switched? Has a pump failed? If "Lead Pump On" switch fails will the "Lag Pump On" switch start the second pump? Mark says it may not.
38. SS lifting cables and power cables are in a position that could keep the mercury switches from floating freely. This could be a reason to mount the power cables in a junction box and have the SS lifting cables on the ladder side.
39. The Seal Failure light came on for pump #1 on Mar11



TELECOPIER COVER SHEET

CANTON DROP FORGE

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: RICK ZOLLINGER
FIRM: _____
CITY: _____
PHONE: () FAX: ()

FROM - NAME: KEITH HOUCKENBACH
FIRM: CANTON DROP FORGE
CITY: CANTON, OHIO

TOTAL NUMBER OF PAGES 4 INCLUDING COVER SHEET.

WE ARE TRANSMITTING ON THE FOLLOWING:

DATE: 3/2/96
TIME: 11:00

IF YOU DO NOT RECEIVE ALL PAGES - PLEASE CALL BACK AS SOON AS POSSIBLE.

TELEPHONE: (216) 477-4511, EXT. _____

- =====
- ① 1ST TRY - I DIDN'T FAX ANYTHING ON 3/6
 - ② FOLLOWING SHORTS ARE OIL/WATER SEPARATOR PROBLEMS.
 - ③ WHERE IS NORTH COAST ENG IN THIS MESS?
 - ④ " " HAMMILL TRO
 - ⑤ WHO SHOULD I BE WORKING WITH TO RESOLVE THE PROBLEMS? I THINK MACK IS REACHING THE END OF THEIR CAPABILITY.

CDF005860

1(c)(d)(e)

ADVISE COUNCIL
WORKMAN PRIMARY
CONTACT
CONFERENCE RESPONSIBILITY
WORKMAN CAUSE
WHEN REPRESENT
ONE WHEN ARE
THEY ON BENCH MARK



1(c)(d)(e)

MACK INDUSTRIES, INC.

April 26, 1996

Mr Sam Schaeffer
WORKMAN INDUSTRIAL SERVICES, INC.
320 Tallmadge Road
Kent, OH 44240

RE: CANTON DROP FORGE PROJECT

Dear Sam:

As you know MACK INDUSTRIES supplied a crew of three to service the Oil Separator on 4/12/96 at the Canton Drop Forge facilities.

Because of the material composition and other properties, we felt that the oil had physically plugged the polypropylene tubes. This was indeed the case as reported by our service people. They pulled all the tube assemblies and steam cleaned each one plus cleaned the interior of the structure before re-installing the tube packs.

The pump which is for dosing was reported by others to be free of any defects. It was tested several times and passed all of the manufacturer's diagnostic procedures and was re-installed in the dosing chamber.

In addition to cleaning and re-installing the pump, the overflow baffle was extended. (This was done to help improve the operation of the unit).

It appears that the system will produce a quality effluent when properly maintained as indicated by the test report on the sample which Workman had analyzed.

CDF005861

MACK INDUSTRIES, INC.

Mr Sam Schaeffer
WORKMAN INDUSTRIAL SERVICES, INC
April 26, 1996
Page 2

A required service frequency will need to be determined by CDF so their maintenance personnel can follow a pre-determined shedule.

If you have any questions or additional thoughts, please contact Dave Gavlak or myself at your convenience.

Sincerely,

MACK INDUSTRIES, INC



Mark Andrukat, Engineering Department

MA/cb

cc: David Gavlak (Sales), Tom Jenkins (Installation)

Enclosure: Daily Job Report Dtd 4/12/96

GGH - workman will be on site
Friday to find pipes.

1 (c)(d)(e)

July 26, 1995

Workman Industrial Services, Inc.
320 Tallmadge Road
Kent, Ohio 44240

Attention: **Jim Workman**

Re: **Canton Drop Forge Industrial Pretreatment**

Dear Jim:

The industrial pretreatment project has been broken into two (2) phases. Phase I is the "yard" oil/water separator, Phase II will consist of the steam/oil separator and the condensate oil/water separator.

We would like to commence with Phase I as soon as possible.

Enclosed for your review and completion are contract documents and equipment cut sheets for the installation of the proposed "yard" oil/water separator.

The specifications as provided to you for Contract 95-1 will be applicable for Phase I. The costs presented are from your April submittal. The design services shown are proportional to the cost of the construction.

Again we would like to move forward with this project as soon as possible. Please call (216) 499-8817 if you have any questions.

Respectfully,

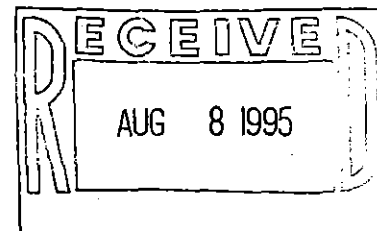
HAMMONTREE & ASSOCIATES, LIMITED

Gene G. Hill, E.I.T., M.S.

cc: Rick Zollinger
Keith Houseknecht
William Cordier
Jerry Bresidnelli

w:workman

CDF005863



Phase I

MAC K INDUSTRIES INC.

VALLEY CITY
(216) 483-3111

AKRON
(216) 762-8715

CLEVELAND
(216) 225-9275

u:\usr\spextext\cdf\cdfiab.doc

1666

TOTAL AMOUNT OF BID

One hundred thirty thousand - (\$ 130,879.00)
(Written Out) eight hundred seventy-nine dollars

The Contractor agrees to complete all of the work specified here in within one hundred eighty (180) calendar days after the date of Notice to Proceed. The contractor further agrees to pay as liquidated damages, the sum of \$500.00 for each consecutive calendar day thereafter as provided in the information and Instructions to Bidders. The bid prices shall include all labor, materials, equipment, overhead, profit, insurance, etc., to cover the finished work.

Bidder understands that Canton Drop Forge (CDF) reserves the right to reject any or all bids and waive any informalities in the bidding. The bidder agrees that this bid shall be good any may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of Notice of Award by CDF, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required. The bid security attached in the form of Bid Guaranty in the sum of One hundred thirty thousand eight hundred - (\$ 130,879.08) is to become the property of CDF in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to CDF caused thereby.

BIDDER acknowledges receipt of the following ADDENDUM:

Addendum No. NONE, Dated _____
Addendum No. _____, Dated _____
Addendum No. _____, Dated _____
Addendum No. _____, Dated _____

CANTON DROP FORGE
Stark County, Ohio
Proposal for
INDUSTRIAL PRETREATMENT SYSTEM
Contract No. 95-1

CANTON DROP FORGE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY AND ALL BIDS.
THE BID WILL BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER.

BID IS FIRM FOR SIXTY (60) DAYS.

ATTACHMENTS: BID GUARANTY BOND OR CONSENT OF SURETY FORM.
NON-COLLUSION AFFIDAVIT

SIGNATURE CLAUSE:

IF A CORPORATION

Workman Industrial Services, Inc.
NAME OF CORPORATION

SIGNATURE: [Signature]
PRESIDENT

SIGNATURE: [Signature]
SECRETARY

IF A PARTNERSHIP:
(List All Partners)

NAME OF PARTNERSHIP

SIGNATURE: _____

SIGNATURE: _____

SIGNATURE: _____

IF AN INDIVIDUAL DOING BUSINESS
UNDER THE FIRM NAME AND STYLE OF:

STATE OF OHIO

COUNTY OF Portage

SIGNATURE: _____

SWORN TO AND SUBSCRIBED BEFORE ME THIS 4th DAY OF August, 1995

Cheryl S. Ellenwood
NOTARY PUBLIC

BID GUARANTY FORM 1
BID GUARANTY BOND

(Not to be filled out if a certified check is submitted)

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned WORKMAN INDUSTRIAL SERVICES, INC., 320 TALLMADGE RD., KENT, OH 442

(Name and Address of Contractor)

as Principal, hereinafter called Principal, and PEERLESS INSURANCE COMPANY,

P. O. BOX 545, DUBLIN, OHIO 43017-0545

(Name and Full Mailing Address of Surety)

as Surety, hereinafter called Surety, are hereby held and firmly bound unto Canton Drop Forge, as Obligeo in the penal sum of the dollar amount of the bid submitted by the Principal to the Obligeo on the 15TH day of MAY, 19 95, to undertake the project known as the INDUSTRIAL PRETREATMENT SYSTEM. The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Obligeo, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligeo, which are accepted by the Obligeo. In no case shall the penal sum exceed the amount of one hundred (100) percent of the bid including any alternates which may be accepted. For the payment of the penal sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal has submitted a bid for the project.

NOW, THEREFORE, if the Obligeo accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the event the Principal pays to the Obligeo the difference not to exceed ten (10) percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligeo may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligeo does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal pays to the Obligeo the difference not to exceed ten (10) percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmission, of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if the Obligeo accepts the bid of the Principal and the Principal within fifteen days after the awarding of the contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of material, which said contract is made a part of this bond the same as though set forth herein:

NOW ALSO, if the said Principal shall well and faithfully do and perform the things agreed by the Principal to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligeo herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

10 8781332
FROM ARCADE
BID GUARANTY BOND

Page 2

The said Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of the said contract or in or to the plans or specifications therefore shall in any way affect the obligations of said Surety on its bond.

Signed this 9TH day of MAY 19 95

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Cheryl S. Ellinwood
Witness of Principal

Mary Kay Gerrets
Witness of Attorney-in-Fact

PRINCIPAL: WORKMAN INDUSTRIAL SERVICES, INC.

By Steve Webb

Title: President

SURETY: PEERLESS INSURANCE COMPANY

By John G. De Angeles
Attorney-in-Fact

P. O. BOX 545

DUBLIN, OHIO 43017-0545

(Full Mailing Address)

(Facsimile signatures are not acceptable)

(This Bond may be photocopied but not retyped)

Sam

NON-COLLUSION AFFIDAVIT

This affidavit is to be filled out and executed by the bidder. If the bid is made by a corporation, then by its properly authorized agent.

The name of the individual swearing to the affidavit should always appear on the line marked "Name of Affiant". The affiant should sign his/her name at end, not a partnership nor corporation name, and swear to said affidavit before a Notary Public, who must attach his seal.

STATE OF OHIO, COUNTY OF PORTAGE, SS.

INDUSTRIAL PRETREATMENT SYSTEM, CANTON DROP FORGE

JAMES T WORKMAN being duly sworn, deposes and says that he is
(Name of Affiant)

PRESIDENT of
(sole owner, partner, president, secretary, etc.)

WORKMAN INDUSTRIAL SERVICES, INC residing

320 TALLMADGE RD, KENT, OH 44240 and that

WORKMAN INDUSTRIAL SERVICES, INC.
(person, firms, corporations interested in the bid)

is or are the only persons interested in the profits of any contract which may result from herein contained proposal; that the said proposal is made without any connection or interests in the profit thereof with any other person making any other bid or proposal for said work; that the said proposal is in all respects fair, and without collusion or fraud; and also that no member of Canton Drop Forge, head of any department or bureau of employee therein, or any officer of Canton Drop Forge, is directly or indirectly interested therein; and that all the statements made by him in this proposal are true.

Signed: [Signature] Title: Pres
Affiant

Subscribed and sworn before me this 26th day of July 19 95.

Cheryl Ellinwood Notary Public

PHASE I - INDUSTRIAL PRETREATMENT
NOTICE OF AWARD

To: WORKMAN INDUSTRIAL SERVICES

Address: 320 Tallmadge Rd, Kent Ohio

INDUSTRIAL PRETREATMENT SYSTEM, CANTON DROP FORGE

Canton Drop Forge has considered the bid submitted by you on MAY 15 1995, for the above mentioned work in response to its advertisement for bids.

You are hereby notified that your bid in the amount of \$ 130,879.00 has been accepted.

You are required by the Information and Instructions to Bidders to execute the contract and furnish the required delinquent personal property tax affidavit, performance bond, certificate of insurance and a copy of your current Workmen's Compensation Certificate within 10 calendar days from the date of this notice,

If you fail to comply with the above requirements, Canton Drop Forge will be entitled to consider all of your rights arising out of the CDF's acceptance of your bid as abandoned and as a forfeiture of your bid guaranty subject to the liability as set forth in Section 153.54 of the Ohio Revised Code. Canton Drop Forge will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to Canton Drop Forge.

Date this 26 day of JUNE, 1995.

~~Canton Drop Forge~~ Hammontree & Associates, Ltd.

By: Gene M Hill
Chairman Gene Hill, Representing CDF

Acceptance of Notice:

Receipt of the above Notice of Award is hereby acknowledged by Workman

Industrial Services this the 4th day of August 1995.

Signature and Title: James I. Lock Pres.

**AGREEMENT
CONTRACT 95-1**

For INDUSTRIAL PRETREATMENT SYSTEM, CANTON DROP FORGE, CANTON, OHIO.

THIS AGREEMENT, made and entered into at Canton, Ohio, this 26 day of JULY, 1995, by and between Canton Drop Forge (CDF), hereinafter called CDF, and a corporation, partnership, individual or _____ known as WORKMAN INDUSTRIAL SERVICES, with an office located at 320 TALLMADGE RD., KENT, OHIO, hereinafter called the "CONTRACTOR".

WITNESSETH

That the CONTRACTOR has agreed and by these presents does agree that the CONTRACTOR, for the consideration of \$ 130,879.00, paid for CDF hereinbefore mentioned and contained in the proposal, and under penalty expressed in a bond bearing even date with these presents, and herein contained or hereunto annexed to furnish at his own cost and expense, all the necessary materials, labor, superintendence, tools and equipment, and shall execute, construct, finish and test in an expeditious, substantial and workmanlike manner, said improvements shown on the contract drawings described in the included specification or required by CDF, with all equipment and appurtenances, commencing work within (10) days from the date of notice from CDF to commence work and executing the same within the time and in the manner specified and in conformity with the requirements set forth in the specification herein contained or hereunto attached in accordance with the contract drawings of said work on file in the office of CDF and all to the acceptance of said CDF.

DESCRIPTION OF WORK

Contractor is to design, construct, purchase and install the Industrial Pretreatment System to include:

PHASE I

1. 120 gpm oil/water separation yard as more fully described in paragraph 4.1 of the Oil/Water Separation Design Report dated October, 1994 (the "Report");

PHASE II

- ~~2. horizontal cyclone oil/steam separator - 120,000 lbs./hr. to achieve 98% efficiency as more fully described in paragraph 2.4(a) of the Report; and~~
- ~~3. oil/water separator to process condensate from the boiler house sump pump, liquid discharge from the separator located just prior to the hot process water softener, and liquid discharge from item 2 above as more fully described in paragraph 4.2(b) of the Report.~~

All the above items are to achieve a maximum discharge of not more than 10 parts per million from the Industrial Pretreatment System.

The CONTRACTOR shall proceed with the said work in a prompt and diligent manner and shall do the several parts thereof at such times and in such order as the Engineer or his duly authorized agent may direct. Further, he shall complete the whole of said work in accordance with the specifications and contract drawings to the satisfaction of CDF and their Engineer.

If the CONTRACTOR shall fail to comply with any of the terms, conditions, provisions, or stipulations of this contract according to the true intent and meaning thereof, then CDF may avail itself of any or all remedies provided in that behalf in the contract, and shall have the right and power to proceed in accordance with provisions thereof.

It is hereby agreed by the parties to this Agreement that the provisions contained in the "Invitation for Bids", in "Information and Instructions to Bidders", in the "Proposal and Bid Form", in the "Insurance Specifications", in the "Performance Bond", in the "General Conditions", in the "Supplemental General Conditions", and in the Report for the improvement, shall constitute integral parts of the agreement and collectively that they shall comprise and be known as the Agreement. It is hereby mutually agreed that CDF is to pay and the CONTRACTOR is to receive, a full compensation for furnishing all materials and labor in building, constructing, and in all respects completing the herein described work and appurtenances in the manner and under the conditions herein specified, the prices stipulated in the proposal herein contained or hereto annexed.

The CONTRACTOR agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

Subject to the applicable provisions of law, this Agreement shall be in full force and effect as a contract from and after the date when a fully executed and approved counterpart hereof is delivered to the CONTRACTOR.

IN WITNESS WHEREOF, the parties hereunto affixed their signatures, the day and year first above mentioned.

CONTRACTOR

Witness: Thyllis King

Date: 8/4/95

By: [Signature]

Title: PRESIDENT

CANTON DROP FORGE

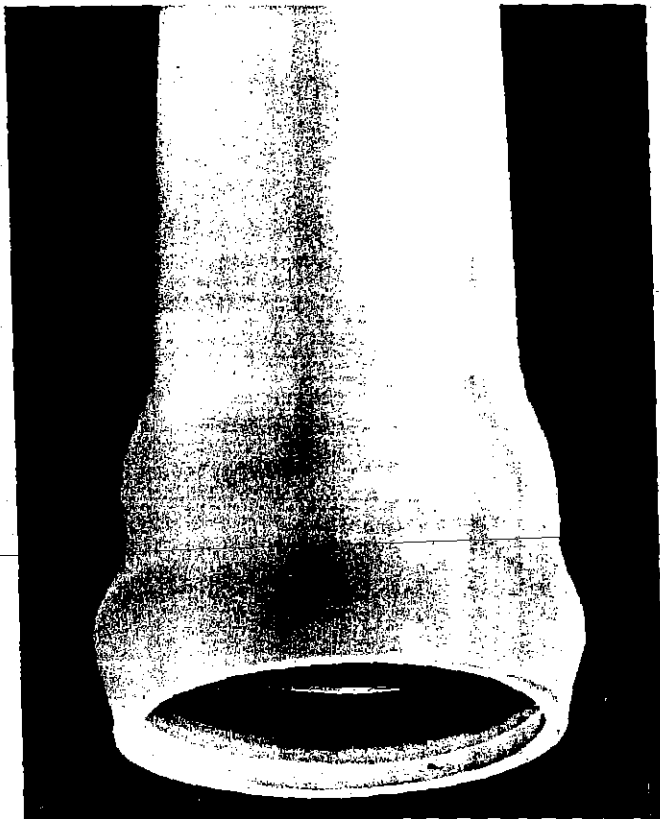
Attest: _____

Date: _____

By: Jerome P. Berranelli
President

Ring-Tite PVC
Pressure Pipe

SEP 18 1973



Designed for Installed-Cost Savings

Save in handling costs. Most sizes can be handled manually, so there is no need for costly installation equipment. Use the backhoe for excavating and backfilling only. Dig more trench, lay pipe faster, save more in costs per foot installed.

Easy Installation. Products should be installed in accordance with J-M Publication TR 533A, Ring-Tite® Installation Guide.

Save on fittings and thrust blocks. J-M Ring-Tite PVC pipe can be curved as shown in the table to eliminate many corners that would require elbows and bends. The costs of these items and labor are saved.

Min. Radii of Curvature

Size (in)	Radius (feet)
1½	38
2	50
2½	63
3	75
4	100
6	150
8	200
10	250
12	300

NOTE: Offsets were calculated assuming no deflection at the joint. The bent pipe is also assumed to form a true arc, i.e., pipe is curved uniformly throughout its length.

Description

Pipe conforms to ASTM 2241 for standard dimension ratios: 125 psi pipe - SDR 32.5; 160 psi pipe - SDR 26; 200 psi pipe - SDR 21. PVC compounds used in the extrusion of this pipe meets or exceeds the requirements of the material section of ASTM D 2241. Rubber rings conform to ASTM F 477.

Applications

Rural water, agricultural and turf irrigation pipelines. The pressure rating of the pipe—125 psi, 160 psi, or 200 psi—indicates the maximum allowable sustained pressure with a long-term 2 to 1 safety factor.

Meets Accepted Standards
NSF Standard 14

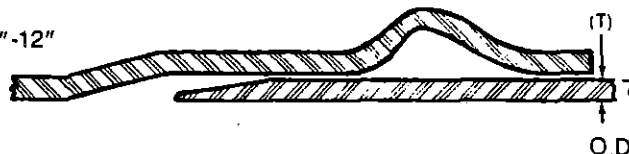
J-M Ring-Tite PVC pipes are manufactured in compliance with ASTM D2241 for pressure rated pipes.

Test	ASTM D2241		
	125 psi	160 psi	200 psi
Long Term Pressure Test 1000 hours	260	340	420
Quick Term Burst Test	400	500	630
Acetone Immersion Test A measure of proper fluxing and precise temperature control	20 min.	20 min.	20 min.
Flattening Test Tests extrusion quality and ductility under slow loading conditions.	60% in 2-5 min.	60% in 2-5 min.	60% in 2-5 min.

Pipe Dimensions

Ring Joint Design

Sizes 1½"-12"



Nominal Size	1½	2	2½	3	4	5"	6	8	10	12
O.D. (Average)	1.900	2.375	2.875	3.500	4.500	5.563	6.625	8.625	10.750	12.750
Min. Wall (125 psi)	0.060	0.073	0.088	0.108	0.138	0.171	0.204	0.265	0.331	0.392
Thickness, (160 psi)	0.073	0.091	0.110	0.135	0.173	0.214	0.255	0.332	0.413	0.490
(T), Ins. (200 psi)	0.090	0.113	0.137	0.167	0.214	0.265	0.316	0.411	0.511	0.606
Prox. Wt. Lbs. / Std. Length										
(125 psi)	4.7	7.1	10.4	15.5	25.5	38.6	55.9	94.0	147.0	207.3
(160 psi)	5.6	8.7	12.8	19.1	31.5	48.2	68.8	117.0	182.4	257.7
(200 psi)	6.8	10.7	15.8	23.4	38.7	59.3	84.5	143.7	224.0	316.4

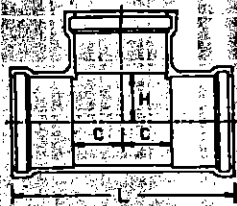
All dimensions are in inches. Laying length for all sizes is 20' ± 1". O.D. dimensions conform to Iron Pipe Size (I.P.S.)

*5" not inventoried—Available only on special request.

Typical Physical and Chemical Properties and Capacities

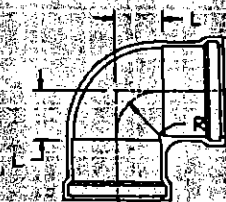
Property	R-T PVC Pipe	ASTM Test Method	ASTM D 2241
ISO Hoop			
Stress at 73F			
Short Term Bursting Strength (PSI)		D1599	6,400
1,000 Hour Strength (PSI)		D1598	4,200
Working Pressure Rating			
73F (% of rating at 73F)	100%		
80F (% of rating at 73F)	88%		
100F (% of rating at 73F)	60%		
Chemical Resistance at 73F			
Acids	Excellent		
Salts—Bases	Excellent		
Aliphatic Hydrocarbons (including crude oil)	Good		
Physical Properties of Std. Test Specimens			
Tensile Strength (psi) at 73F		D638	7,000
Thermal Expansion (in./100 ft./50°F change)			
	2"		
Fire Resistance			
	Self Extinguishing		
Coefficient of Flow			
Williams-Hazen	C = 150		

CDF005874



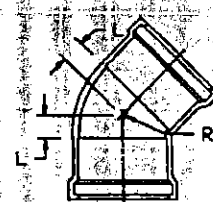
TEES

Cat. No.	Size	C	H	L	Wt
10333	8 x 8	4.6	4.8	19.3	21.3
10334	8 x 6	4.6	4.8	19.3	19.3
10335	8 x 4	4.6	4.8	19.3	18.7
10344	6 x 6	3.6	3.7	16.2	12.3
10345	6 x 4	3.6	3.7	16.2	11.0
10355	4 x 4	2.4	2.6	13.1	5.6
10356	4 x 3	2.4	2.6	13.1	4.9
10358	4 x 2	2.4	2.6	13.0	4.3
10366	3 x 3	2.0	2.2	10.9	2.8
10377	2.5 x 2.5	1.8	2.0	9.9	1.7
10388	2 x 2	1.4	1.5	9.2	1.4



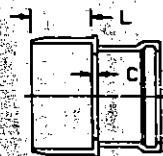
90 BEND

Cat. No.	Size	L	R	Wt
10530	8	4.5	4.2	16.3
10540	6	3.6	3.2	9.0
10550	4	2.5	2.2	3.8
10560	3	2.0	1.7	1.8
10570	2.5	1.6	1.4	1.3
10580	2	1.3	1.2	1.8



45 BEND

Cat. No.	Size	L	R	Wt
10630	8	2.0	4.2	13.3
10640	6	1.6	3.2	7.8
10650	4	1.1	2.2	3.4
10660	3	0.9	1.7	1.6
10670	2.5	0.7	1.4	1.1
10680	2	0.6	1.2	0.8



REDUCER

Cat. No.	Size	L	C	Wt
10434	8 x 6	4.4	0.4	5.8
10445	6 x 4	3.8	0.4	2.7



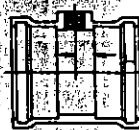
REDUCER
STYLE 2

Cat. No.	Size	L	R	Wt
10456	4 x 3	3.2	0.2	1.1
10457	4 x 2.5	3.2	0.2	1.2
10458	4 x 2	3.2	0.2	1.1
10467	3 x 2.5	3.6	0.2	0.8
10468	3 x 2	3.2	0.2	0.7
10478	2.5 x 2	3.6	0.1	0.6
10489	2 x 1.5	3.6	0.1	0.5



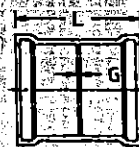
PLUG

Cat. No.	Size	L	Wt
10930	8	4.4	3.8
10940	6	3.6	2.3
10950	4	3.2	0.4
10960	3	3.1	0.4
10970	2.5	2.4	0.8
10980	2	2.8	0.2
10990	1.5	2.2	0.3



TAPPED TEE

Cat. No.	Size	L	Wt
1104x	6	1.3	5.8
1105x	4	1.3	3.1
1106x	3	3.0	2.5
1107x	2.5	1.9	1.5
1108x	2	2.7	1.2



COUPLING

Cat. No.	Size	L	G	Wt
10130	8	11.1	25	10.3
10140	6	9.4	25	5.6
10150	4	8.4	19	2.7
10160	3	7.2	19	1.3
10170	2.5	7.0	19	0.9
10180	2	6.6	09	0.7
10190	1.5	6.4	09	0.5



REPAIR COUPLING

Cat. No.	Size	L	Wt
10230	8	11.1	10.2
10240	6	9.4	5.5
10250	4	8.4	2.7
10260	3	7.2	1.3
10270	2.5	7.0	1.0
10280	2	6.6	0.7
10290	1.5	6.4	0.5



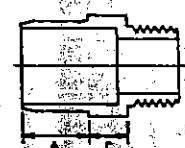
SPIGOT ADAPTOR

Cat. No.	Size	L	OD	Wt
11260	3	2.0	3500	0.9
11270	2.5	2.0	2875	0.7
11280	2	1.3	2375	0.5
11290	1.5	1.1	1900	0.3



BELL x MPT ADAPTER

Cat. No.	Size	C	Wt
10740	8	7.8	10.3
10750	4	6.6	4.5
10760	3	2.9	1.5
10770	2.5	0.3	1.2
10780	2	0.4	0.5
10790	1.5	1.5	0.5

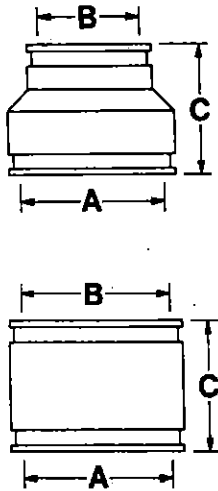


PE x MPT ADAPTER

Cat. No.	Size	A	C	Wt
10840	6	4.3	0.4	5.3
10850	4	3.4	0.4	2.0
10860	3	3.0	0.3	1.3
10870	2.5	2.5	0.3	0.8
10880	2	2.7	0.3	0.3
10890	1.5	2.7	0.2	0.3

Couplings

103/Clay to Asbestos Cement or Ductile Iron

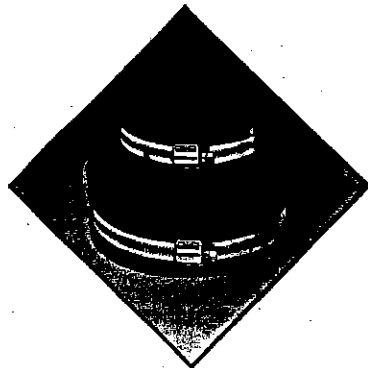


Part #	Pipe Size	A	B	C
103-44	4 x 4	5.30	4.75	4.00
103-54	5 x 4	6.40	4.75	5.00
103-55	5 x 5	6.40	5.90	6.00
*103-56	5 x 6	6.40	7.00	6.00
103-64	6 x 4	7.50	4.75	6.00
103-65	6 x 5	7.50	5.90	6.00
103-66	6 x 6	7.50	7.00	6.00
*103-68	6 x 8	7.50	9.12	6.00
103-86	8 x 6	9.75	7.00	6.00
103-88	8 x 8	9.75	9.12	6.00
103-1010	10 x 10	11.95	11.12	6.50
103-1212	12 x 12	14.50	13.20	6.50
103-1516	15 x 16	18.25	17.40	7.00
103-1818	18 x 18	21.50	19.50	9.00

104/Concrete to Concrete

Part #	Pipe Size	A	B	C
104-44	4 x 4	5.62	5.62	4.00
104-64	6 x 4	7.80	5.62	6.00
104-66	6 x 6	7.80	7.80	6.00
104-86	8 x 6	10.25	7.80	6.00
104-88	8 x 8	10.25	10.25	6.00
104-1010	10 x 10	13.00	13.00	7.00
104-1212	12 x 12	15.55	15.55	7.00
104-1515	15 x 15	19.50	19.50	9.00
104-1818	18 x 18	22.70	22.70	9.00
104-2121	21 x 21	26.20	26.20	9.00
104-2424	24 x 24	29.70	29.70	9.00
104-2727	27 x 27	33.20	33.20	9.00

106/Concrete to Cast Iron or Plastic



Part #	Pipe Size	A	B	C
*106-43	4 x 3	5.62	3.40	4.00
106-44	4 x 4	5.62	4.40	4.00
*106-63	6 x 3	7.80	3.40	6.00
106-64	6 x 4	7.80	4.40	6.00
106-66	6 x 6	7.80	6.40	6.00
106-86	8 x 6	10.25	6.40	6.00
106-88	8 x 8	10.25	8.55	6.00
106-1010	10 x 10	13.00	10.60	7.00
106-1212	12 x 12	15.55	12.60	7.00
106-1515	15 x 15	19.50	15.30	9.00
106-1818	18 x 18	22.70	18.70	11.25

*Supplied with reducer.

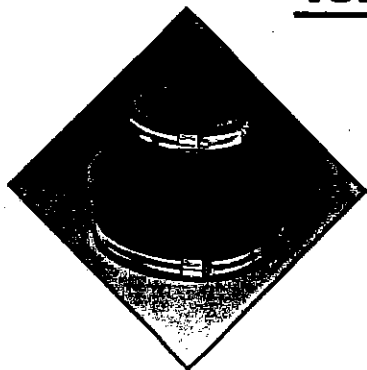
Couplings

Indiana Seal manufactures a complete line of couplings for clay, cast iron, ductile iron, concrete and plastic pipe, in sizes from 1 1/4" up to 27". Constructed of tough yet pliable PVC, these couplings are impervious to normal sewer gases, chemicals, fungus growth, various soil conditions, the menace of roots and all other associated in-ground hazards. Each coupling is produced and inspected under strict quality control standards to assure the highest degree of integrity at any junction in the line.

101/Clay to Clay

Part #	Pipe Size	A	B	C
101-44	4 x 4	5.30	5.30	4.00
*101-54	5 x 4	6.40	5.30	6.00
101-55	5 x 5	6.40	6.40	6.00
101-64	6 x 4	7.50	5.30	6.00
101-66	6 x 6	7.50	7.50	6.00
*101-85	8 x 5	9.75	6.40	6.00
101-86	8 x 6	9.75	7.50	6.00
101-88	8 x 8	9.75	9.75	6.00
101-1010	10 x 10	11.95	11.95	6.50
101-1212	12 x 12	14.50	14.50	6.50
101-1515	15 x 15	18.25	18.25	7.00
101-1818	18 x 18	21.50	21.50	7.00
101-2121	21 x 21	25.25	25.25	9.00
101-2424	24 x 24	28.50	28.50	9.00
101-2727	27 x 27	32.10	32.10	9.00
101-3030	30 x 30	35.00	35.00	9.00

102/Clay to Cast Iron or Plastic



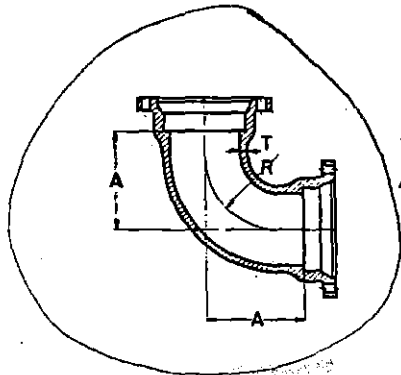
Part #	Pipe Size	A	B	C
102-43	4 x 3	5.30	3.40	4.00
102-44	4 x 4	5.30	4.40	4.00
*102-46	4 x 6	5.30	6.40	6.00
*102-53	5 x 3	6.40	3.40	6.00
*102-54	5 x 4	6.40	4.40	6.00
*102-55	5 x 5	6.40	5.50	6.00
*102-56	5 x 6	6.40	6.40	6.00
*102-63	6 x 3	7.50	3.40	6.00
102-64	6 x 4	7.50	4.40	6.00
102-65	6 x 5	7.50	5.50	6.00
102-66	6 x 6	7.50	6.40	6.00
*102-68	6 x 8	7.50	8.55	6.00
102-86	8 x 6	9.75	6.40	6.00
102-88	8 x 8	9.75	8.55	6.00
*102-108	10 x 8	11.95	8.55	6.50
102-1010	10 x 10	11.95	10.60	6.50
102-1210	12 x 10	14.50	10.60	6.50
102-1212	12 x 12	14.50	12.60	6.50
102-1512	15 x 12	18.25	12.60	7.00
102-1515	15 x 15	18.25	15.30	7.00
102-1815	18 x 15	21.50	15.30	9.00
102-1818	18 x 18	21.50	18.70	9.00

*Supplied with reducer.

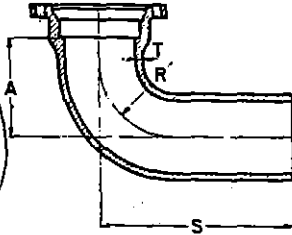
UNION FOUNDRY COMPANY

Specifications and Dimensions ANSI / AWWA C-110 / A21.10 MECHANICAL JOINT FITTINGS DUCTILE IRON

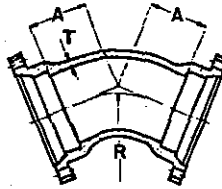
BENDS



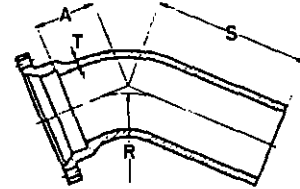
MJ x MJ 90°
21-0010



MJ x PE 90°
21-0120



MJ x MJ 45°
21-0510



MJ x PE 45°
21-0600

Size	Pressure Rating psi	Dimensions in Inches 90° Bends				Weight in Pounds *	
		T	R	A	S	MJ x MJ	MJ x PE
3	350	.48	4.0	5.5	13.5	35	35
4	350	.52	4.5	6.5	14.5	56	50
6	350	.55	6.0	8.0	16.0	85	80
8	350	.60	7.0	9.0	17.0	125	121
10	350	.68	9.0	11.0	19.0	197	190
12	350	.75	10.0	12.0	20.0	255	255
14	350	.82	11.5	14.0	22.0	380	413
16	350	.89	12.5	15.0	23.0	490	470
18	350	.96	14.0	16.5	24.5	625	600
20	350	1.03	15.5	18.0	26.0	938	886
24	350	1.16	18.5	22.0	30.0	1215	1260
30	250	1.03	21.5	25.0	33.0	1690	1585
36	250	1.15	24.5	28.0	36.0	2629	2310

Size	Pressure Rating psi	Dimensions in Inches 45° Bends				Weight in Pounds *	
		T	R	A	S	MJ x MJ	MJ x PE
3	350	.48	3.62	3.0	11.0	30	30
4	350	.52	4.81	4.0	12.0	50	45
6	350	.55	7.25	5.0	13.0	83	70
8	350	.60	8.44	5.5	13.5	110	105
10	350	.68	10.88	6.5	14.5	155	155
12	350	.75	13.25	7.5	15.5	215	229
14	350	.82	12.06	7.5	15.5	300	280
16	350	.89	13.25	8.0	16.0	442	360
18	350	.96	14.50	8.5	16.5	548	445
20	350	1.03	16.88	9.5	17.5	575	664
24	350	1.16	18.12	11.0	19.0	865	825
30	250	1.03	27.75	15.0	23.0	1480	1275
36	250	1.15	35.00	18.0	26.0	2435	1930

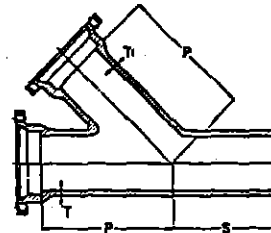
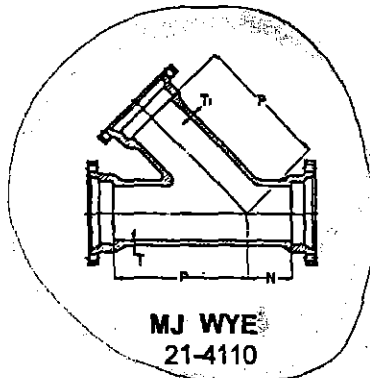
* Weight does not include accessories weight or cement lining weight.

NOTE: Furnished with mechanical joint bell on all openings unless ordered otherwise.

UNION FOUNDRY COMPANY

Specifications and Dimensions MECHANICAL JOINT FITTINGS DUCTILE IRON Manufacturer's Standard

WYES



Size		Pressure Rating psi	Dimensions in inches					Weight in Pounds*	
Run	Branch		T	T1	N	P	S	ALL MJ	MJ x PE x MJ
3	3	NR	.48	.48	3.0	10.0	11.0	60	72
4	3	NR	.52	.48	3.0	12.0	-	80	-
4	4	NR	.52	.52	3.0	12.0	11.0	90	85
6	3	NR	.55	.48	3.5	14.5	11.5	120	115
6	4	NR	.55	.52	3.5	14.5	11.5	130	125
6	6	NR	.55	.55	3.5	14.5	11.5	145	140
8	3	NR	.60	.48	4.5	17.5	12.5	180	185
8	4	NR	.60	.52	4.5	17.5	12.5	190	185
8	6	NR	.60	.55	4.5	17.5	12.5	205	200
8	8	NR	.60	.60	4.5	17.5	12.5	230	185
10	4	NR	.68	.52	5.0	20.5	13.0	270	270
10	6	NR	.68	.55	5.0	20.5	13.0	335	285
10	8	NR	.68	.60	5.0	20.5	13.0	310	310
10	10	NR	.68	.68	5.0	20.5	13.0	435	340
12	4	NR	.75	.52	5.5	24.5	-	380	-
12	6	NR	.75	.55	5.5	24.5	13.5	400	400
12	8	NR	.75	.60	5.5	24.5	13.5	505	425
12	10	NR	.75	.68	5.5	24.5	13.5	450	450
12	12	NR	.75	.75	5.5	24.5	13.5	490	490
14	6	NR	.82	.55	6.0	27.0	14.0	626	555
14	8	NR	.82	.60	6.0	27.0	-	595	-
14	10	NR	.82	.68	6.0	27.0	-	625	-
14	12	NR	.82	.75	6.0	27.0	14.0	670	670
14	14	NR	.82	.82	6.0	27.0	-	803	-
16	6	NR	.89	.55	6.5	30.0	14.5	735	715
16	8	NR	.89	.60	6.5	30.0	14.5	760	735
16	10	NR	.89	.68	6.5	30.0	-	800	-
16	12	NR	.89	.75	6.5	30.0	14.5	835	815
16	14	NR	.89	.82	6.5	30.0	-	900	-
16	16	NR	.89	.89	6.5	30.0	14.5	1079	940

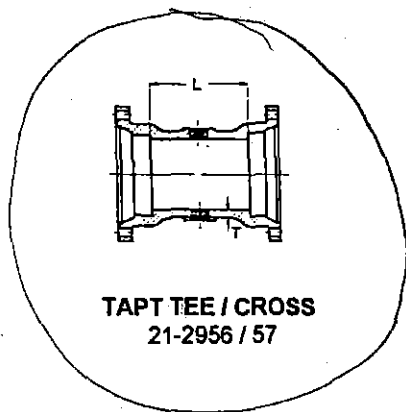
NR Wyes are not included in AWWA C-110 Specifications. Contact Manufacturer for pressure rating for specific application.

* Weights do not include accessories or cement lining weights.

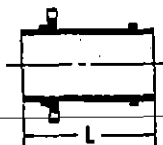
UNION FOUNDRY COMPANY
 Specifications and Dimensions
AWWA C-110 MECHANICAL JOINT FITTINGS
 DUCTILE IRON

TAPPED TEES and CROSSES

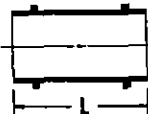
(TWO BOSSES CAN BE USED TO MAKE A TAPPED CROSS)



Size	Pressure Rating psi	Dimensions in inches		Maximum Tap in Boss (inches)	Weight in pounds*
		T	L		
3	350	.48	8.0	2½	35
4	350	.52	8.0	2½	45
6	350	.55	8.0	2½	70
8	350	.60	8.0	2½	116
10	350	.68	8.0	2½	145
12	350	.75	8.0	2½	185
14 **	350	.82	8.0	2½	272
16 **	350	.89	8.0	2½	329
18 **	350	.96	8.0	2½	480
20 **	350	1.03	8.0	2½	420
24 **	350	1.16	8.0	2½	555



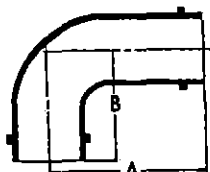
SWIVEL x SOLID
21-4660



SWIVEL x SWIVEL
21-4665

HYDRANT ADAPTERS **
(Anchor Couplings)
Manufacturer's Standard

Size	Pressure Rating psi	Length - inches		Weight in pounds	
		SWIVEL x SOLID	SWIVEL x SWIVEL	SWIVEL x SOLID	SWIVEL x SWIVEL
4 x 13	350	12.5	-	66	-
4 x 18	350	18	-	75	-
4 x 24	350	24	-	90	-
6 x 12	350	12	12	66	57
6 x 13	350	12.5	-	67	-
6 x 18	350	18	18	79	71
6 x 24	350	24	-	90	-
6 x 36	350	36	-	139	-
8 x 13	350	12.5	-	113	-



**SWIVEL x SWIVEL
90° BEND**
21-0460

SWIVEL x SWIVEL 90° BEND **
Manufacturer's Standard

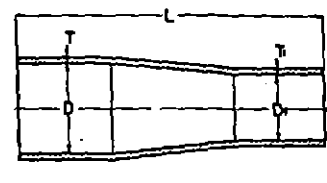
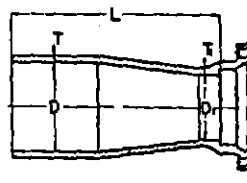
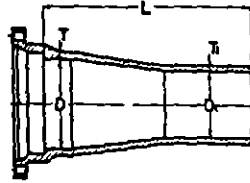
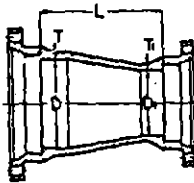
Also referred to as MJ Anchoring Elbow, this bend combines two Swivel x Swivel adapters and a 90° Bend. The two different laying lengths allow hydrants to be placed at either of two distances parallel to the main. Manufactured in 6" size only. Weight is 92 pounds including hydrant glands (2).

* Weights do not include accessories or cement lining weights.
 ** Not included in AWWA C-110. Produced to Manufacturer's Standards.

UNION FOUNDRY COMPANY

Specifications and Dimensions AWWA C-110 MECHANICAL JOINT FITTINGS DUCTILE IRON

REDUCERS



MJ x MJ
21-3510

Large End MJ
21-3700

Small End MJ
21-3710

PE x PE
21-3780

Size		E C C	Pressure Rating psi	Thickness inches		L-Laying Length (in)				Weight in Pounds*			
D	D1			T	T1	MJ x MJ	Large End MJ	Small End MJ	PE x PE	MJ x MJ	Large End MJ	Small End MJ	PE x PE
3	2**		350	.48	.35	6.0	8.5	8.5	22.0	24	25	17	26
4	2**		350	.52	.35	7.0	9.5	9.5	23.0	31	30	16	25
4	3		350	.52	.48	7.0	15.0	15.0	23.0	45	40	40	36
6	2**	M	350	.55	.35	9.0	9.5	9.5	-	44	38	28	-
6	3	M	350	.55	.48	9.0	17.0	17.0	25.0	55	55	50	50
6	4	M	350	.55	.52	9.0	17.0	17.0	25.0	60	60	60	55
8	3**	M	350	.60	.48	11.0	19.0	19.0	27.0	85	75	70	70
8	4	MS	350	.60	.52	11.0	19.0	19.0	27.0	87	80	86	75
8	6	MLSP	350	.60	.55	11.0	19.0	19.0	27.0	95	90	90	85
10	3**		350	.68	.48	12.0	-	20.0	-	100	-	95	-
10	4	M	350	.68	.52	12.0	20.0	20.0	28.0	105	100	100	100
10	6	MSP	350	.68	.55	12.0	20.0	20.0	28.0	130	115	115	115
10	8	MS	350	.68	.60	12.0	20.0	20.0	28.0	135	130	130	130
12	4	MS	350	.75	.52	14.0	22.0	22.0	30.0	135	130	130	130
12	6	MLS	350	.75	.55	14.0	22.0	22.0	30.0	174	151	150	145
12	8	MLSP	350	.75	.60	14.0	22.0	22.0	30.0	182	165	183	179
12	10	M	350	.75	.68	14.0	22.0	22.0	30.0	220	185	210	204
14	6	S	350	.82	.55	16.0	24.0	24.0	32.0	200	200	185	185
14	8	M	350	.82	.60	16.0	24.0	24.0	32.0	220	220	205	205
14	10	M	350	.82	.68	16.0	24.0	24.0	32.0	245	245	230	230
14	12	L	350	.82	.75	16.0	24.0	24.0	32.0	270	275	255	260
16	6	LSP	350	.89	.55	18.0	26.0	26.0	34.0	250	250	230	230
16	8	M	350	.89	.60	18.0	26.0	26.0	34.0	270	270	250	250
16	10	ML	350	.89	.68	18.0	26.0	26.0	34.0	300	300	298	280
16	12	MLSP	350	.89	.75	18.0	26.0	26.0	34.0	371	386	305	335
16	14	MS	350	.89	.82	18.0	26.0	26.0	34.0	370	355	350	335

M - MJ x MJ also available in Eccentric.

L - LEMJ also available in Eccentric.

S - SEMJ also available in Eccentric.

P - PE x PE also available in Eccentric.

* Weights do not include accessories or cement lining weights.

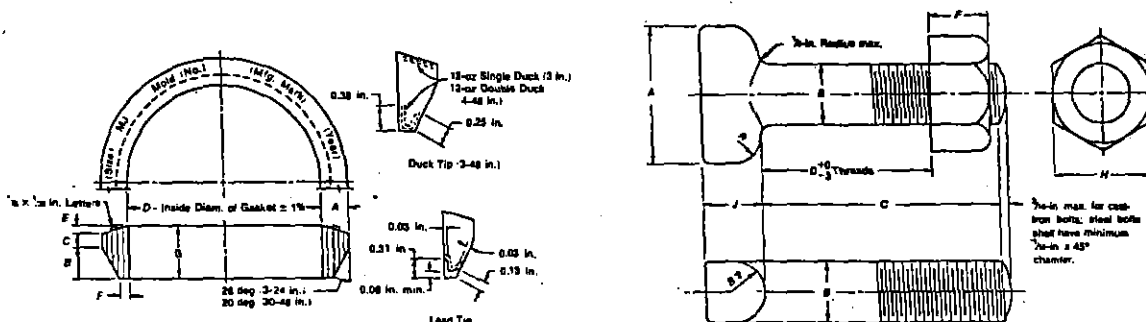
** Not included in AWWA C-110. Produced to Manufacturer's Standards.

UNION FOUNDRY COMPANY

Specifications and Dimensions

ANSI / AWWA C-110 / A21.10 MECHANICAL JOINT FITTINGS ANSI / AWWA C-111 / A21.11 RUBBER GASKET JOINTS FOR FITTINGS DUCTILE IRON

GASKETS, BOLTS and NUTS FOR MECHANICAL JOINTS



MECHANICAL JOINT GASKET

MECHANICAL JOINT BOLTS and NUTS

Pipe Size	Pipe OD	Mechanical Joint Gasket Dimensions in inches						
		A (±0.01)	B	C	D (±1.0%)	E (±0.01)	F (±0.01)	G (±0.02)
3	3.96	.48	.62	.31	3.86	.12	.15	1.05
4	4.80	.62	.75	.31	4.68	.16	.22	1.22
6	6.90	.62	.75	.31	6.73	.16	.22	1.22
8	9.05	.62	.75	.31	8.85	.16	.22	1.22
10	11.10	.62	.75	.31	10.87	.16	.22	1.22
12	13.20	.62	.75	.31	12.95	.16	.22	1.22
14	15.30	.62	.75	.31	14.99	.16	.22	1.22
16	17.40	.62	.75	.31	17.07	.16	.22	1.22
18	19.50	.62	.75	.31	19.13	.16	.22	1.22
20	21.60	.62	.75	.31	21.20	.16	.22	1.22
24	25.80	.62	.75	.31	25.34	.16	.22	1.22
30	32.00	.73	1.00	.38	31.47	.16	.37	1.54
36	38.30	.73	1.00	.38	37.67	.16	.37	1.54

NOTE: Tipped or backed gaskets may be made in the same mold as plain rubber gaskets, but the inside diameter of such reinforced portions shall not exceed the " pipe OD ". The duck for tips and backs shall be frictioned before molding.

Nominal Size	T - Head Cor-ten (Low alloy steel) Bolts and Nuts Dimensions in inches							
	A (±.05)	B (±.03)	C (+.25-.06)	D	E*	F	H	J (+.15-.03)
5/8 x 3	1.50	.625	3.0	1.50	11	.625±.04	1.062-.04	.625
3/4 x 3 1/2	1.75	.750	3.5	1.50	10	.750±.06	1.250-.06	.750
3/4 x 4	1.75	.750	4.0	2.25	10	.750±.06	1.250-.06	.750
3/4 x 4 1/2	1.75	.750	4.5	2.50	10	.750±.06	1.250-.06	.750
3/4 x 5	1.75	.750	5.0	3.00	10	.750±.06	1.250-.06	.750
1 x 6	2.25	1.000	6.0	3.75	8	1.000±.08	1.625-.08	1.00
								R Max.
								.312
								.375
								.375
								.375
								.375
								.500

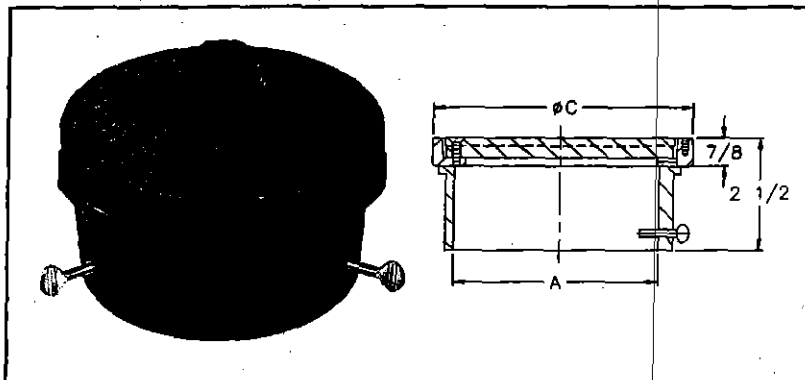
* Number of threads per inch [Coarse-Thread Series (ANSI B1.1 - Unified Standard for Screw Threads) Class 2A, External Fit UNC2A and Class 2B, (ANSI B1.2 - Standard for Gages and Gaging)].

NOTE: Dimension "B" is unthreaded shank. Dimension "D" is measured to face of nut run up finger tight. Draft, when required to be 6 degree maximum, may be deducted from bolt head dimensions, and radius (B/2) may be changed to suit draft. Gates, if required, may protrude a maximum of 1/8 inch above the top of the bolt head.

CLEANOUTS



Z-1404 FLOOR ACCESS HOUSING



Dimensions In Inches		App. Wt. Lbs.
A Pipe Size	C	
2	5-1/8	2
3	6-1/8	3
4	7-1/4	4
5	8-1/4	7
6	9-1/4	8

ENGINEERING SPECIFICATION: ZURN Z-1404 Floor access housing, Dura-coated cast iron with round frame and scoriated secured cover complete with adjusting set screws.

OPTIONS

ACCESS HOUSING (Specify pipe size in inches and type of outlet)

CONNECTION TYPE	CONNECTION DESIGNATION Pipe Size/Outlet Type
Slip Joint	2SJ, 3SJ, 4SJ, 5SJ, 6SJ

PREFIXES (See chart for pricing)

- Z- D.C.C.I. Body and Top*
- ZB- D.C.C.I. Body with Polished Bronze Top
(Deduct 1/2" from 7/8" Dim.)
- ZN- D.C.C.I. Body with Polished Nickel Bronze Top
(Deduct 1/2" from 7/8" Dim.)

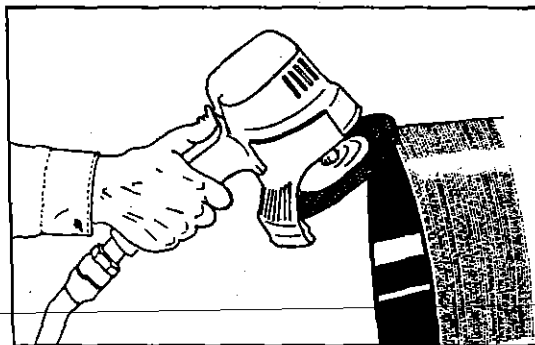
The Backhoe Method of Assembly

A backhoe may be used to assemble pipe of intermediate and larger sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to push the pipe until fully seated. A timber header should be used between the pipe and backhoe bucket to avoid damage to the pipe.

Field Cut Pipe

Figure 11

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4-inch at an angle of about 30 degrees (Figure 11). This can be quite easily done with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.



Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches	Approximate Radius in Feet of Curve Produced by Succession of Joints
		18 ft. Length	18 ft. Length
4	5°	19	206
6	5°	19	206
8	5°	19	206
10	5°	19	206
12	5°	19	206
14	5°	19	206
16	5°	19	206
18	5°	19	206
20	5°	19	206
24	5°	19	206
30	5°	19	206
36	5°	19	206
42	4°	17*	286*
48	4°	17*	286*
54	4°	17*	286*

*20-foot length

**U.S.
PIPE**

Thicknesses, Dimensions and Weights of Ductile Iron TYTON JOINT® Pipe

Thicknesses, dimensions and weights of 4" through 54" Ductile Iron pipe conforming to ANSI/AWWA C151/A21.51.

Size Inches	Thickness Class	Thickness	Outside Diameter*	18-Foot Laying Length	
				Weight Per Length†	Avg. Weight Per Foot ‡
				Inches	Pounds
4	51	0.26	4.80	215	11.9
	52	0.29	4.80	235	13.1
	53	0.32	4.80	260	14.3
	54	0.35	4.80	280	15.6
	55	0.38	4.80	300	16.7
	56	0.41	4.80	320	17.8
6	50	0.25	6.90	305	16.9
	51	0.28	6.90	340	18.7
	52	0.31	6.90	370	20.5
	53	0.34	6.90	400	22.3
	54	0.37	6.90	435	24.1
	55	0.40	6.90	470	25.9
	56	0.43	6.90	500	27.6
8	50	0.27	9.05	430	23.9
	51	0.30	9.05	475	26.4
	52	0.33	9.05	520	28.9
	53	0.36	9.05	565	31.3
	54	0.39	9.05	605	33.7
	55	0.42	9.05	645	35.9
	56	0.45	9.05	690	38.4
10	50	0.29	11.10	570	31.6
	51	0.32	11.10	625	34.7
	52	0.35	11.10	680	37.7
	53	0.38	11.10	735	40.7
	54	0.41	11.10	785	43.6
	55	0.44	11.10	840	46.6
	56	0.47	11.10	890	49.5
12	50	0.31	13.20	725	40.2
	51	0.34	13.20	790	43.8
	52	0.37	13.20	855	47.4
	53	0.40	13.20	920	51.1
	54	0.43	13.20	985	54.6
	55	0.46	13.20	1045	58.1
	56	0.49	13.20	1110	61.7

*Tolerance of O.D. of spigot end: 4-12 in., ± 0.06 in.; 14-24 in., $+0.05$ in., -0.08 in.; 30-54 in., $+0.08$ in., -0.06 in.

†Including bell; calculated weight of pipe rounded off to nearest 5 lb.

‡Including bell; average weight, per foot, based on calculated weight of pipe before rounding.

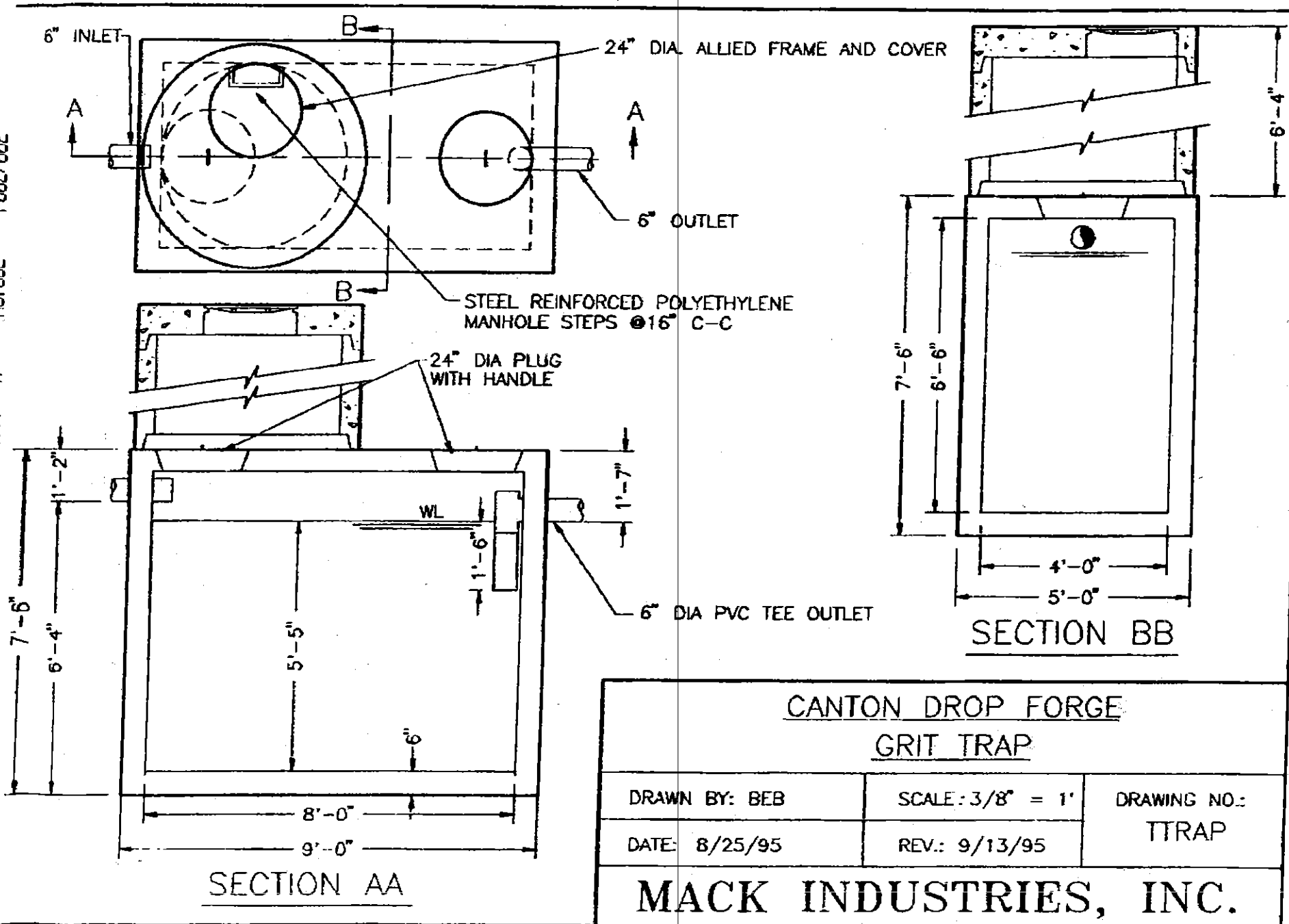
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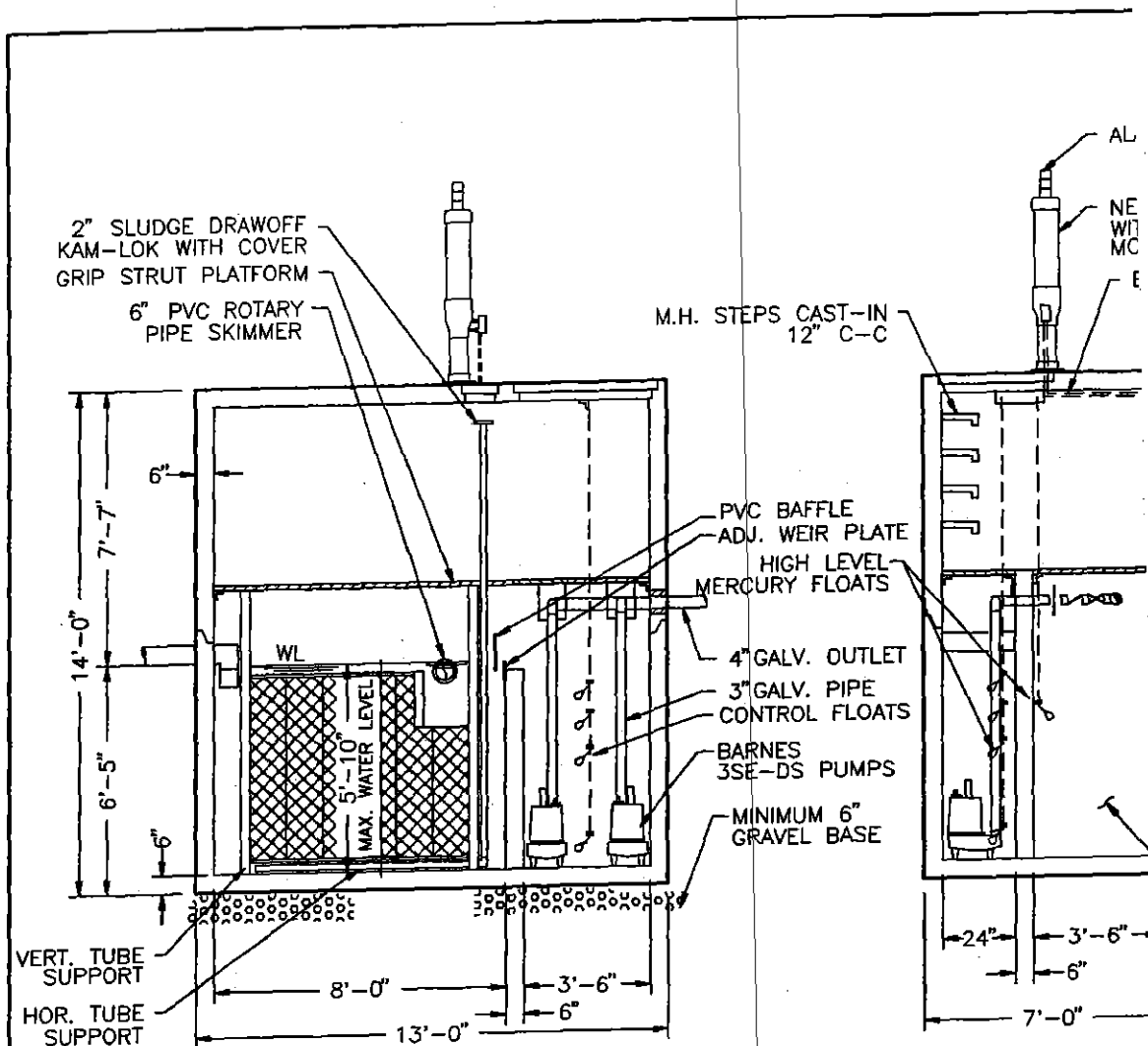
Thickness Class for each Rated Working Pressure of Ductile Iron Pipe

Standard Thickness Classes for Working Pressure plus 100 psi Surge Allowance*

Pipe Size Inches	Working Pressures (psi)				
	150	200	250	300	350
4	51	51	51	51	51
6	50	50	50	50	50
8	50	50	50	50	50
10	50	50	50	50	50
12	50	50	50	50	50
14	50	50	50	50	50
16	50	50	50	50	50
18	50	50	50	50	50
20	50	50	50	50	51
24	50	50	50	51	52
30	50	50	51	52	53
36	50	50	51	52	53
42	50	50	51	52	53
48	50	50	51	52	53
54	50	50	51	52	53

*Design Pressure = Working pressure as listed above plus 100 psi surge allowance \times 2.0 safety factor.





PUMP SPECIFICATIONS

MANUFACTURER	BARNES
MODEL	3SE1042DS
G.P.M.	120
T.D.H.	12.56
HORSEPOWER	1
R.P.M.	3450
VOLTAGE	460
PHASE	3
SOLIDS SIZE	1-1/2"

NOTES:

JOINTS SHALL BE SEALED WITH A DOUBLE STRIP OF CS-440 SEALANT

8-14-95 FIELD DATA

1% FALL 14 DRAIN PIPE
From 10" Clay to Separator (150' ±)

SEPERATOR AREA
GROUND EL.

-1.52 ±

CDF005889



2" CLAY DIE LUBE DRAIN

- 5.73



10" CLAY DRAIN

-5.92

May 17, 1995

CANTON DROP FORGE
4575 Southway Street S.W.
Canton, Ohio 44706

Subj: Industrial Pretreatment System
Contract 95-1

ATTACHMENT "A"

Gentlemen:

Please accept our Proposal to Design and Construct your Industrial Pretreatment System.
Pricing includes:

- Process Equipment as described in the "Process Considerations" section of this Attachment "A".
- Further analysis of waste streams to assure that process equipment will meet acceptable performance levels.

At this time, we are unable to meet the performance levels set forth in the contract documents. We have not included a Bid Bond with our bid documents. A bond will be supplied when performance levels are established and agreed to by all parties.

PROCESS CONSIDERATIONS

Water Side Separation Facilities

West Side Oily Water Separator

The original intent of the "West Side" Separator (WSS), was to treat the three (3) streams originating from the Forge Shop which enters Pond No. 1. It is our understanding that Canton Drop Forge (CDF) now wants to tie in the emergency overflow from the Die Cleaning Station (approx. 1-2 gpm, but could be concentrated kerosene), and the spill-line from the Oil House. Although the separator will have some capacity for handling raw product spills, it is recommended that these be dealt with at the source and not be allowed to enter the sewer system discharging to the WSS.

Samples were collected from the two streams furthest north in the Forge Shop, and subjected to quiescent settling, after which analysis for total oil was made. This data

Where Service Is More Than A Promise



Industrial and Municipal Contractors

implies that simple settling could potentially produce an effluent with reasonable low oil content. To confirm that the WSS could consistently produce an effluent with less than 10mg/1, a pilot demonstration will be required. A sample was not obtained from the stream which collects steam condensate and emergency overflows from the Die-Lube catch basin, on the south end of the Forge Shop. Based on information obtained on the main steam separator condensate, there is a concern that the steam condensate could pose a problem for the performance of the WSS. We believe this steam condensate must be routed to the "East Side" Separator (ESS) (see below).

To protect the separator from Die-Lube discharges it is recommended to include a series of two (2) easily removable "catch basins" to be constructed immediately upstream of the WSS.

East Side Oily Water Separator

Oily condensates from the Boiler House, and the existing main separator and the Anvils in the Forge Shop, currently enter the storm water system which discharges to Pond No. 2.

A sample was obtained by Great Lakes Environmental, Inc. from the steam condensate line of the main separator, which after quiescent settling, contained about 60 mg/1. Another sample was collected by CDF from the manhole immediately downstream of where the steam condensate from the main separator enters the sewer. This sample in which the oil appeared to be emulsified, was also allowed to settle prior to testing for oil content. The oil content after settling was almost 1,700 mg/1! Simple settling cannot produce an acceptable effluent for this stream. Without pilot testing, it is not possible to predict what effluent a separator equipped with coalescing element could produce, but it is expected that it would not be acceptable. Alternatives would include a coalescer, acid treatment (to break emulsion), dissolved air flotation (most likely with use of chemicals), or a combination of these. Furthermore, the pH of the sample containing the high oil content was 4.0. Adjustment for pH may be required to produce an effluent acceptable for discharge.

It is recommended that pilot testing be performed both for the WSS and the ESS. For the WSS, it is possible that simple settling, without the use of coalescing elements, will produce an "acceptable" (perhaps higher than 10mg/1 oil) effluent. This would be preferred from a maintenance point of view. If so, there is no reason to test with a coalescing element.

For the ESS, it is recommended that pilot testing includes both a separator and a coalescer. It would be of interest to observe the performance of an oil/water separator

equipped with a coalescing element, however, if the condensate sample collected by CDF is representative of normal conditions, it is not expected that the performance will be acceptable. A coalescer may perform satisfactorily, but a prediction cannot be made without performing a pilot test. The pilot coalescer unit can be equipped with several different coalescing elements (or "packs") designed to perform for particles in the range of: 1) 100 microns or more, 2) 20-100 microns, 3) <1-50 microns, and 4) 0-10 microns. Some of these can tolerate high temperatures, some cannot.

Tests to break the emulsion with acid treatment or use of chemicals is not included at this time; neither is running dissolved air flotation tests.

Our current bid includes an oil/water separator equipped with a coalescing element for both the WSS and ESS, although for the ESS we expect that a coalescer is needed. No pH control system is included.

Steam Side Separation Facilities

Upon recontacting the steam separator vendors which provided information supplied in FBA Environmental's previous study for CDF, it was learned that some of the equipment was not large enough to treat the design basis of 120,000 lbs/hr in a single unit and perform at a 98% removal efficiency. It should also be noted that all vendors are qualifying the performance of their equipment, by relating their performance to a micron size. All vendors have quoted that with centrifugal units or mist eliminators, they can remove 98% or better of 10 micron size materials. However, concerns for a large variation of the steam rate, is causing another vendor to question the application of a centrifugal unit to consistently perform at this high removal rate. It is therefore important to obtain flow data on the steam discharge.

Based on the above, our current bid includes a single mist eliminator. It has been difficult to identify a method or piece of equipment which serves as a standard in the industry to obtain measurements which can be used as a basis for design and as a basis to evaluate performance in the field. Some equipment mentioned includes a "Forward Scattering Laser Spectrometer", a "Laser Particle Count Analyzer" etc.

ITEMS SPECIFICALLY EXCLUDED FROM OUR PROPOSAL:


1. Normal housekeeping and preventative maintenance work prior to acceptance as called for in Note 3 of Page 11 of the proposal documents.
2. Costs for obtaining permits, including Permit to Install from the Ohio EPA.
3. We have assumed that a continuous compressed air supply will be available to supply air to diaphragm pumps. Costs for an air compressor are not included.
4. Costs for pipe insulation.

5. Removal or relocation of materials which are in the way of new construction. We have assumed that these items will be moved by CDF forces.
6. Removal and disposal of asbestos.
7. Removal of any excavated (or demolished) materials from the jobsite.
8. At this time, a bid bond as well as a performance and payment bond is not included. These will be provided when final process selection is made, and when mutually agreed upon performance levels are identified.
9. Meeting performance requirements until we have identified and pilot tested the equipment to be used.
10. Liquidated damages until performance criteria is established.
11. Remediation of any existing hazardous waste.
12. Project sign as called for in 01500.
13. pH Control Systems.

If our team is selected to perform the work, we will do everything we can to help conserve costs. To this end, we are willing to disclose all costs included in our proposal, and work together with you to reduce them.

We anticipate discussing your project further, and helping you bring it to a successful conclusion.

Very truly yours,



Thomas Greve
Vice President

lai

CANTON DROP FORGE
Stark County, Ohio
Proposal for
INDUSTRIAL PRETREATMENT SYSTEM
Contract 95-1

- NOTE 1: THE SIGNING OF THE BID REPRESENTS THE BIDDER'S ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE INSTRUCTIONS TO BIDDERS AND THE SPECIFICATIONS AND PROVISIONS AND THAT THE BIDDER WILL ENTER INTO THE CONTRACT IF HE IS AWARDED THE BID AND WILL ENTER SAID CONTRACT WITHIN TEN (10) DAYS OF NOTICE OF AWARD. BID IS TO BE FIRM AND MAY NOT BE WITHDRAWN FOR A PERIOD OF SIXTY (60) CALENDAR DAYS.
- NOTE 2: THE BIDDER AGREES THAT CANTON DROP FORGE HAS THE RIGHT TO REJECT ANY OR ALL BIDS AND TO WAIVE INFORMALITY IN ANY BID AND THAT THE BIDDER SHALL NOT DISPUTE THE CORRECTNESS OF THE METHODS USED IN COMPUTING THE LOWEST RESPONSIBLE BIDDER.
- NOTE 3: ALL COSTS OF MAINTENANCE WORK DURING CONSTRUCTION AND BEFORE THE FINAL ACCEPTANCE IS MADE SHALL BE INCLUDED IN THE LUMP SUM PRICES BID ON THE VARIOUS BID ITEMS AND THE CONTRACTOR WILL NOT BE PAID AN ADDITIONAL AMOUNT FOR SUCH WORK.

TO: CANTON DROP FORGE
4575 SOUTHWAY STREET S.W.
P.O. BOX 44706
CANTON, OHIO 44706

FROM: BOWEN ENGINEERING CORPORATION

FIRM NAME

P.O. Box 40729

Indianapolis, IN 46240

ADDRESS

TELEPHONE NO. 317-842-2616

Attachment "A" hereby becomes part of this proposal.

**Canton Drop Forge
Industrial Pretreatment System**

April 1995

Item No	Item	Est'd Quantity	Unit	Separate Unit Prices (figures)		Combined Unit Prices (to be written in words)	Quantity Times Unit Total
				Mat'L	Labor	Mat'l-Labor-Unit-Total	Amount
4.1	120 gpm oil/water separation yard system - complete	Lump Sum	1				\$144,000
4.2a	98% efficient horizontal cyclone oil/steam separator - 120,000 lbs/hr - complete	Lump Sum	1				82,000
4.2b	Condensate oil/water separator w/boiler house sump pump revisions - complete	Lump Sum	1				99,000
	Design Services	Lump Sum					41,000
	Pilot Studies/Testing	Lump Sum	1				32,000

TOTAL AMOUNT OF BID

Three Hundred Ninety-eight
Thousand Dollars (\$ 398,000.00)
(Written Out)

The Contractor agrees to complete all of the work specified here in within one hundred eighty (180) calendar days after the date of Notice to Proceed. The contractor further agrees to pay as liquidated damages, the sum of \$500.00 for each consecutive calendar day thereafter as provided in the information and Instructions to Bidders. The bid prices shall include all labor, materials, equipment, overhead, profit, insurance, etc., to cover the finished work.

Bidder understands that Canton Drop Forge (CDF) reserves the right to reject any or all bids and waive any informalities in the bidding. The bidder agrees that this bid shall be good any may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of Notice of Award by CDF, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required. The bid security attached in the form of Bid Bond in the sum of (\$) is to become the property of CDF in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to CDF caused thereby.

BIDDER acknowledges receipt of the following ADDENDUM:

Addendum No. 1, Dated April 27, 1995

Addendum No. , Dated

Addendum No. , Dated

Addendum No. , Dated

CANTON DROP FORGE
Stark County, Ohio
Proposal for
INDUSTRIAL PRETREATMENT SYSTEM
Contract No. 95-1

CANTON DROP FORGE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY AND ALL BIDS.
THE BID WILL BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER.

BID IS FIRM FOR SIXTY (60) DAYS.

ATTACHMENTS: BID GUARANTY BOND OR CONSENT OF SURETY FORM.
 NON-COLLUSION AFFIDAVIT
 ATTACHMENT "A"

SIGNATURE CLAUSE:

IF A CORPORATION

BOWEN ENGINEERING CORPORATION

NAME OF CORPORATION

SIGNATURE: _____

Thomas J. Greve, Vice President

SIGNATURE: _____

Daniel F. Clark, SECRETARY

IF A PARTNERSHIP:
(List All Partners)

NAME OF PARTNERSHIP

SIGNATURE: _____

SIGNATURE: _____

SIGNATURE: _____

IF AN INDIVIDUAL DOING BUSINESS
UNDER THE FIRM NAME AND STYLE OF: _____

STATE OF ~~OHIO~~ INDIANA

COUNTY OF Hamilton

SIGNATURE: _____

Rinda M. Carey, Notary Public

SWORN TO AND SUBSCRIBED BEFORE ME THIS 17th DAY OF May, 19 95

NOTARY PUBLIC

Rinda M. Carey

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

The signatory of this proposal guarantees the truth and accuracy of all statements and of all answers to interrogatories hereinafter made.

1. How many years have you been in business as a General Contractor under you present business name? 27 Years
2. How many years have you been in principal officer of a general contracting firm under another name? N/A
3. What projects of a similar nature has your organization completed?

(Note: Fill out each blank completely)

Name of Owner and Location	Name and Address of Person in Responsible Charge as Reference	Class of Work	Amount of Contract	Date of Completion
United Technologies	Greg Blessing 203-728-6592	Soil/Vapor Extraction	\$1,500,000	1994
Kerr-McGee	Gavin Stead 317-359-8222	Various Projects	\$2,500,000	1990-1994
Firestone Ind'l. Products	Al Pustinger 317-773-0650	Groundwater Remediation	\$2,000,000	1991-1995
Reilly Industries	Linda Hicks 317-247-8141	Various Projects	\$500,000	1992-1995
Indianapolis Water Company	Bob Miller 317-263-6361	Water Treatment	\$16,000,000	1991-1995
Consumers Water Co.	Steve Himmel	Various Projects	\$17,000,000	1991-1995
	Additional will be supplied upon request.			

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

Have you, or your Company, or any organization of which you have been a responsible officer or agent, ever failed to complete any work awarded to you? If so, where and why?

No

The work awarded or to be awarded will have the personal supervision of whom?

Jeff Purdue

Ron Hutchins

Explain approximately your plan and layout for performing the proposed work.

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

7. What equipment do you own that is available for the proposed work?

Quantity	Description Size, Capacity, Etc.	Condition	Years of Service
See Attached List			

8. At what places are the principal items of the equipment located?

Our equipment is currently spread out on 20 project sites.

We will move a Hydraulic Excavator and a Rubber-Tired Backhoe

onto the Canton Drop Forge project when it is required.

Bowen Engineering Corporation
Equipment List

Year	Manufacturer	Capacity	Description
1993	Manitowoc M-50W	50 Ton	Crawler Crane
1991	Manitowoc M-50W	50 Ton	Crawler Crane
1989	Manitowoc M-50W	50 Ton	Crawler Crane
1994	Grove	35 Ton	Hydraulic Crane
1990	Lorain LRT 350D	35 Ton	Hydraulic Crane
1989	Lorain LRT 350D	35 Ton	Hydraulic Crane
1994	Cat 330L	1.5 CY	Hydraulic Excavator
1994	John Deere 790E	1.5 CY	Hydraulic Excavator
1994	Kobelco SK300LC	2 CY	Hydraulic Excavator
1994	Kobelco SK220LC	1.5 CY	Hydraulic Excavator
1993	Kobelco SK300	2 CY	Hydraulic Excavator
1993	Kobelco SK220	1.5 CY	Hydraulic Excavator
1992	Kobelco SK300	2 CY	Hydraulic Excavator
1989	Kobelco K916	3 CY	Hydraulic Excavator
1989	Komatsu PC220	1.5 CY	Hydraulic Excavator
1988	Koehring 1066	4.5 CY	Hydraulic Excavator
1988	Koehring 6633	1.5 CY	Hydraulic Excavator
1989	Kobelco K916	3 CY	Hydraulic Excavator
1995	Cat 426		Rubber Tired Loader/Hoe
1994	Cat 416B		Rubber Tired Loader/Hoe
1994	Cat 416		Rubber Tired Loader/Hoe
1992	Ford 655C Backhoe		Rubber Tired Loader/Hoe
1991	Ford 655C Backhoe		Rubber Tired Loader/Hoe
1989	John Deere 410C		Rubber Tired Loader/Hoe
1989	John Deere 410C		Rubber Tired Loader/Hoe
1994	Cat IT28F	2 CY	Rubber Tired Front End Loader
1994	Cat IT28F	2 CY	Rubber Tired Front End Loader
1990	Cat 963 Loader	2.5 CY	Track Loader
1989	Cat 963 Loader	2.5 CY	Track Loader
1989	Cat 963 Loader	2.5 CY	Track Loader
1993	Cat 936 Loader	2.5 CY	Wheel Loader
1992	Cat 950 Loader	3.5 CY	Wheel Loader
1989	Cat 936E Loader	3 CY	Wheel Loader
1988	Cat 936 Loader	2.5 CY	Wheel Loader
1994	Cat D-4C w/6 Way Blade		Dozer
1990	John Deere 650 w/6 Way Blade		Dozer
1989	Cat D-7 Dozer		Dozer
1989	Cat D-4H w/6 Way Blade		Dozer
1994	Mack Semi	40 Ton	Road Tractor
1989	Ford Semi	40 Ton	Road Tractor
1993	Trail King		Low Boy
1993	Vermeer T800		Trencher
1992	Ford 350 w/Drill Rig		Auger Test Rig
1989	Ford F-800	2 Ton	Flatbed Truck
	Pick Up Trucks (54)		

Revised: January 1995

NON-COLLUSION AFFIDAVIT

This affidavit is to be filled out and executed by the bidder. If the bid is made by a corporation, then by its properly authorized agent.

The name of the individual swearing to the affidavit should always appear on the line marked "Name of Affiant". The affiant should sign his/her name at end, not a partnership nor corporation name, and swear to said affidavit before a Notary Public, who must attach his seal.

INDIANA
STATE OF ~~OHIO~~, COUNTY OF Hamilton, SS.

INDUSTRIAL PRETREATMENT SYSTEM, CANTON DROP FORGE

Thomas J. Greve being duly sworn, deposes and says that he is
(Name of Affiant)

Vice President of
(sole owner, partner, president, secretary, etc.)

Bowen Engineering Corporation residing
10315 Allisonville Road, Fishers, IN 46038 and that

Bowen Engineering Corporation
(person, firms, corporations interested in the bid)

is or are the only persons interested in the profits of any contract which may result from herein contained proposal; that the said proposal is made without any connection or interests in the profit thereof with any other person making any other bid or proposal for said work; that the said proposal is in all respects fair, and without collusion or fraud; and also that no member of Canton Drop Forge, head of any department or bureau of employee therein, or any officer of Canton Drop Forge, is directly or indirectly interested therein; and that all the statements made by him in this proposal are true.

Signed: *Daniel F. Clark* Title: Daniel F. Clark, Secretary/Treasurer
Affiant

Subscribed and sworn before me this 17th day of May 19 95.

Rinda M. Carey Notary Public
Rinda M. Carey

HAMMONTREE & ASSOCIATES, LIMITED

Engineers • Planners • Surveyors
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

Canton 216/499-8817
Akron 216/633-7274

FAX 216/499-0149
Toll Free 1-800-394-8817

LETTER OF TRANSMITTAL

RECEIVED

DATE

5/19/95

MAY 24 1995

ATTENTION

KEITH HOUSEKNECT

CANTON DROP FORGE

RE

- ① INDUSTRIAL PRETREATMENT
BID OPENING MINUTES
② BIOREMEDIATION CONTRACT
ADDITIONS

TO CANTON DROP FORGE
4575 SOUTHWAY STREET
P.O. BOX 6902
CANTON, OHIO 44706-0902

WE ARE SENDING ☐ ATTACHED ☐ UNDER SEPARATE COVER VIA _____:

- ☐ SAMPLES
☐ LITERATURE
☐ PLANS
☐ PRINTS

- ☐ SHOP DRAWINGS
☐ ENGINEERING DRAWINGS
☐ CHANGE ORDERS
☐ LETTERS

- ☐ CONTRACTS
☐ OTHER _____

COPIES	DATE	NO	DESCRIPTION

THESE ARE BEING SENT:

- ☐ FOR YOUR APPROVAL
☐ FOR YOUR USE
☐ FOR YOUR REVIEW
☐ FOR YOUR COMMENTS
☐ FOR YOUR SIGNATURE
☐ FOR YOUR _____
- ☐ APPROVED AS NOTED
☐ APPROVED AS SUBMITTED
☐ APPROVED AS CHANGED
☐ REJECTED AS NOTED
☐ REJECTED AS CHANGED
☐ RETURNED FOR CORRECTIONS

- ☐ RESUBMIT _____ COPIES FOR APPROVAL
☐ SUBMIT _____ COPIES FOR DISTRIBUTION
☐ RENEW _____ COPIES FOR

NOTES _____

CDF005903

COPY TO

BIDDERS

SIGNATURE

Gene M. Hill

TITLE

DATE

5/19/95

R. JAMES HAMMONTREE, P.E., P.S.
BRUCE M. BAIR, P.E., P.S.
LAWRENCE D. PHILLIPS, P.E., P.S.
CHARLES F. HAMMONTREE, P.E., P.S.
RONALD P. DOHY, P.S.
GARY L. TOUSSANT, P.S.
JOSE E. TOLEDO, P.E., P.S.
RICHARD R. COOK, P.E., P.S.
JAMES C. BOLLIBON, P.E., P.S.
KEITH A. BENNETT, P.E., P.S.
BARBARA H. BENNETT, P.E., P.S.

1(c)(d)(e) -

HAMMONTREE & ASSOCIATES, LIMITED

Consulting Engineers - Planners - Surveyors

TREMORE BUILDING
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

PHONE (216) 499-8817
FAX (216) 499-0149
TOLL FREE 1-800-394-8817

MICHAEL L. DECKER, P.S.
RICHARD J. FAULHABER, P.E., P.S.
GREGORY E. MENCER, A.P.A.
DANIEL J. GRINSTAD, P.E.
MARK E. FRANZEN, P.E.
KARL J. OPRISCH, P.E.
JEFFREY L. SPRAY, P.S.
PAUL A. TOMIC, P.S.
WILLIAM N. CLARK, P.E., P.S.
THOMAS J. KING, P.S.
DOMINIC A. MARTUCCIO, P.E., P.S.
PAUL A. MILLER, P.S.

MEETING MINUTES

INDUSTRIAL PRE-TREATMENT BID OPENING

May 17, 1995

Canton Drop Forge

12:00 Noon

RECEIVED

MAY 24 1995

CANTON DROP FORGE

Attendees: Keith Houseknecht - CDF
Larry Phillips - H&A
Gene Hill - H&A
Harald Jacobsen - FBA
Tom Greve - Bowen

Items:

1. Bowen had a copy of their performance bond for viewing but the performance bond was not submitted at this time.
2. Removal of emulsified oils was main concern of Bowen and FBA.
3. Bowen & FBA felt some units and modifications were justified to reduce long term O&M costs.
4. H&A and CDF will look into changing the 10 mg/l oil and grease limit to some higher number prior to the interview and award.
5. Changes in costs, if any, associated with the changing the discharge limits will be of interest to CDF and H&A.
6. Samples of the steam condensate from the hot water process and the Anvils will be retrieved by Keith Houseknecht and provided to the bidders if requested. The intent is to allow the bidders to perform tests on the "emulsified" mixture or provide oil/water separator manufactures samples to verify treatability.

RECEIVED

MAY 24 1995

CANTON DROP FORGE

MEETING MINUTES
INDUSTRIAL PRE-TREATMENT BID OPENING
May 17, 1995
Page 2

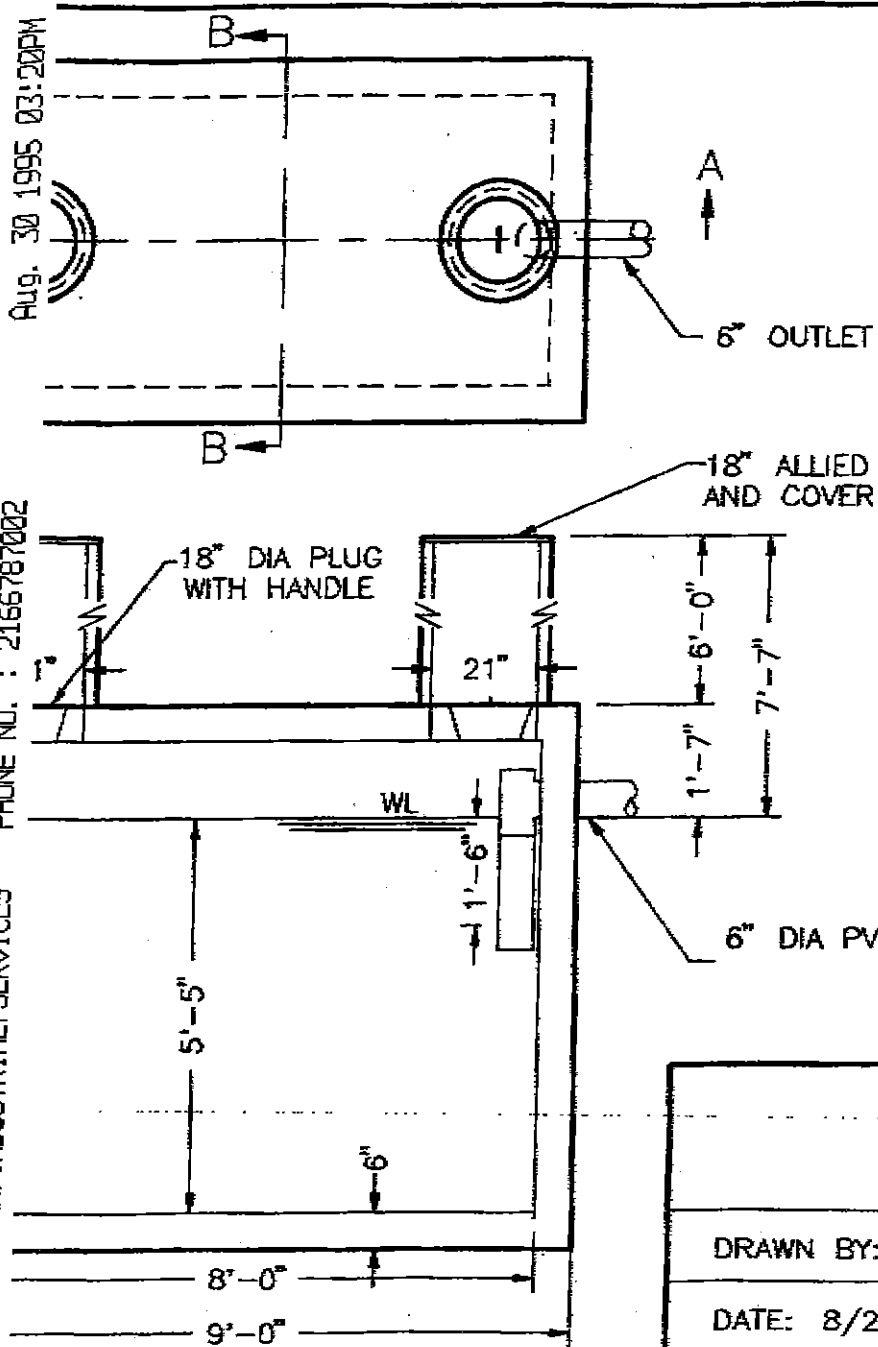
7. H&A and CDF will review the technical and financial aspects of each bid and schedule a meeting with each bidder to allow clarification and open discussion concerning qualification of the bids.
8. If requested, steam condensate samples will be provided to the bidders prior to the individual bid discussion meetings.
9. CDF may investigate the use of different (possibly non-emulsifying) oil to use in the anvils.
10. A list of comments and questions resulting from bid review will be provided to each bidder prior to individual bid discussion meeting.

w.mary/minutes2

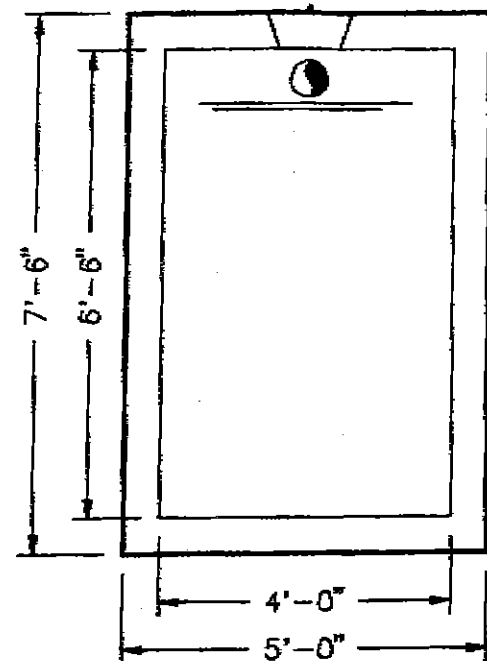
Aug. 30 1995 03:20PM P03

PHONE NO. : 2166787002

FROM : 2166787002 INDUSTRIAL SERVICES



NOTE:
18" DIA MH. ABOVE INLET IS OPTIONAL



SECTION BB

CANTON DROP FORGE
GRIT TRAP

DRAWN BY: BEB

SCALE: 3/8" = 1'

DRAWING NO.:

DATE: 8/25/95

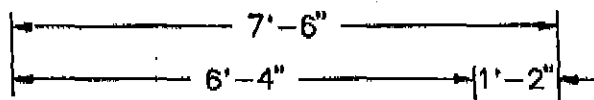
REV.:

TTRAP

SECTION AA

MACK INDUSTRIES, INC.

CDF005907



→ A

5" IN



1(c)(d)(e)

320 Tallmadge Road • Kent, Ohio 44240 • (216) 678-7002 • Fax (216) 678-7332

FACSIMILE TRANSMISSION

DATE 8 23 95 TIME 2:45 ATTENTION MEITH HOUSE KNECHT
TO CANTON DROP FORGE
FACSIMILE NUMBER 477 2046 NUMBER OF PAGES 2
BUSINESS NUMBER _____
FROM SAM SCHAEFER
REGARDING GRIT TANK

MEITH

HERE IS A DRAWING OF GRIT TANK PLEASE
REVIEW + LET ME KNOW IF YOU APPROVE
SO I ORDER IT.

THANKSSAM

678-7002 - Sam



CHAMPION



Combustion Corporation

Wooster, OH 44691 • (216) 345-6915

14" - S" = 9" SUMP Pump on DEF

6' DIA

$$\pi r^2 = \pi 3^2 = 28.27 \text{ ft}^2$$

$$.75' \times 28.27 \text{ ft}^2 = 21.21 \text{ ft}^3$$

$$21.21 \times 7.484 = 158.7 \text{ GAL}$$

ACTUAL
CAPACITY
TRAP

$$4' \times 8' = 32 \text{ sq ft}$$

$$.75' \times 32 \text{ sq ft} = 24 \text{ ft}^3$$

$$24 \text{ ft}^3 \times 7.484 \frac{\text{GAL}}{\text{ft}^3} = 179.62 \text{ GAL}$$

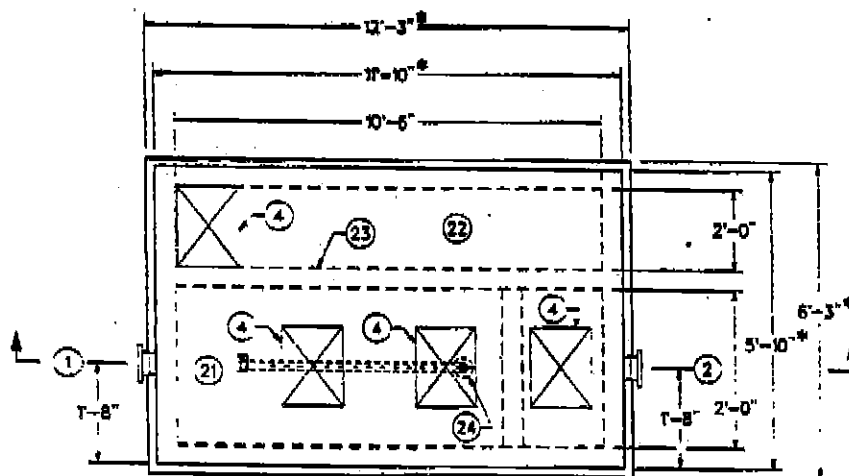


Harrisonburg Plant
P. O. Box 432
Harrisonburg, Virginia 22801
1-800-648-(CAST)2278

Halltown Plant
P. O. Box 120
Halltown, West Virginia 25423
1-800-648-4580

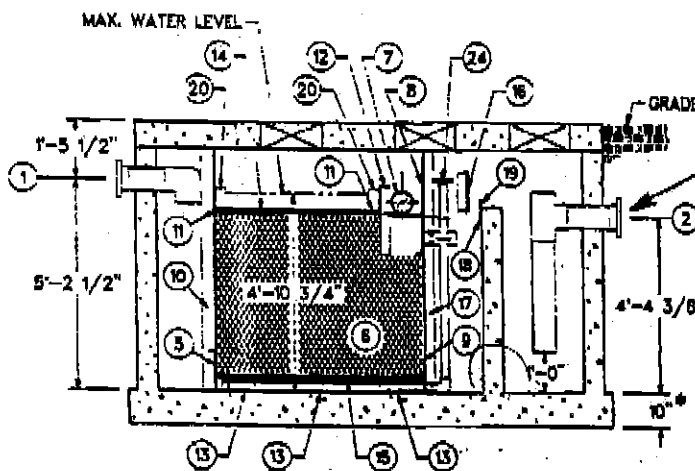
Assembly List CVTS 100 GPM

- 1 6" Ø Inlet, Flanged
- 2 6" Ø Outlet, Flanged
- 3 6" Ø Transfer Pipe
- 4 Access Manways**
- 5 Inlet Baffle
- 6 Vertical Tube Coalescers
- 7 6" Ø Rotary Pipe Skimmer
- 8 Oil Retention Baffle
- 9 Sludge Baffle
- 10 Vertical Tube Support (2 Required)
- 11 Horizontal Tube Hold Down w/handle
- 12 Vertical Tube Support (2 Required)
- 13 Bottom Tube Support (6 Required)
- 14 Top Grating
- 15 Bottom Grating
- 16 Sheen Baffle
- 17 Vertical Angle for 8 & 9
- 18 Adjustable Outlet Weir Plate
- 19 Weir Plate Gasket
- 20 Swivel Angle Arm for Tube Hold Down
- 21 CVTS Chamber
- 22 Integral Waste Oil Storage Chamber
- 23 Partition Wall
- 24 2" Ø Sludge Drawoff, Flanged

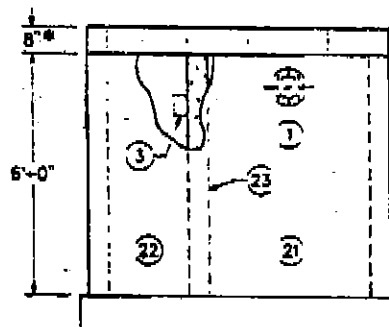


Plan View

EFFLUENT OVERFLOW
ELEVATION SET
AT STANDARD



Section View



Inlet Elevation

* Floor, walls, and top slab dimensions as shown are for reference only. Actual thickness will be determined by a professional engineer based on individual applications
**Manway sizes & locations will vary with each specific unit.

Separator Model	Weight of Top Slab	Weight of Structure with Internals	Coalescing Surface Area Ft ²	Integral Waste Oil Storage Capacity
CVTS-100F2	6,600 lbs.	35,000 lbs.	1748	700 Gal.

Dimensions, Weights, and Capacities are for reference only and are not to be used for construction.

$$TOTAL = 700 + 870 = 1570 \text{ GALS}$$

Additional Notes & Installation Procedures on back.



FACSIMILE TRANSMITTAL

1(c)(d)(e)

DATE: 10-17-95 TIME: 9:00 ☒ A.M. () P.M.TO: NAME: KEITHBUSINESS NAME: CANTON DROP FORGEFACSIMILE NUMBER: 477-2046FROM: HAMMONTREE AND ASSOCIATES, LIMITED
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720TELEPHONE NUMBERS: (216) 499-8817 CANTON OFFICE
(216) 633-7274 AKRON OFFICE
(216) 499-0149 FACSIMILESENDER'S NAME: BOB TUCCIPROJECT: CDFNUMBER OF PAGES (INCLUDING THIS PAGE): 2BRIEF DESCRIPTION (OPTIONAL): _____

_____ADDITIONAL INSTRUCTIONS OR MESSAGES TO RECIPIENT:

ConfidentialLABOR AND MACHINE RATES

Page 1

LABOR RATESPER HOUR

General Labor\$27.00
 Overtime\$36.00
 Premium\$45.00

Supervisor\$31.00
 Overtime\$42.50
 Premium\$53.00

MACHINE RATESPER HOUR

Bore Machine\$55.00
 Cement Mixer\$ 5.00
 Compressors
 Up to 300 CFM.....\$ 9.00
 Concrete Bucket\$40.00/DY
 Concrete Vibrator\$ 5.00
 Cranes
 18 Ton Crawler\$35.00
 18 Ton Rough Terrain Hydraulic Crane\$35.00
 30 Ton Truck\$47.00
 Dozers
 60 H.P. 450 John Deere\$21.00
 250 H.P. C5 Terex.....\$52.00
 Excavators
 Ford Backhoe\$21.00
 3/4 C.Y. Excavator\$36.00
 1 1/4 C.Y. Excavator\$58.00
 Hammers
 Demolition Hammer, Excavator, Compressor Combination\$994.00/DY
 Jack Hammer\$ 9.00
 Pionjar Hammer\$ 9.00
 Rotary Hammer\$ 9.00
 Impact Wrench\$ 3.00
 Laser\$ 50.00
 Loaders
 1.5 C.Y. Rubber Tired\$ 21.00
 2.0 C.Y. Track\$ 38.00
 Pipe Threading Equipment\$ 5.00
 Power Buggy\$ 7.00
 Power Tools
 Drill\$ 3.00
 Grinder\$ 4.00

LABOR AND MACHINE RATES

Page 2

PER HOUR

Pressure Washer	\$ 65.00/DY
Pump 3"	\$ 5.00
Saws	
Chain Saw	\$ 8.00
Concrete Saw w/diamond blade	\$ 16.00
Cutoff Saw	\$ 8.50
Small Tractor w/tools	\$ 20.00
Tamper	\$ 8.00
Trailer	\$ 9.00
Trucks	
Carry All	\$ 30.00
Dump Truck Single Axle	\$ 12.00
Dump Truck Tandem Axle	\$ 17.00
Fork Truck	\$ 13.00
Utility Truck	\$ 11.00
Welders	
Acetylene	\$ 8.00
Electric	\$ 8.00

Material = Cost + 15%

Subcontract = Cost + 10%

1(c)(d)(e)



320 Tallmadge Road • Kent, Ohio 44240 • (216) 678-7002 • Fax (216) 678-7332

FACSIMILE TRANSMISSION

DATE OCT. 6/1995 TIME _____ ATTENTION KEITH HOUSEKNECT
TO CANTON DROP FORGE
FACSIMILE NUMBER 477 2096 NUMBER OF PAGES 4
BUSINESS NUMBER 477 4511
FROM SAM SCHAEFER
REGARDING HOSTILE DRAIN LINE INTO CATCH BASIN

HAMMONTREE & ASSOCIATES, LIMITED

MACK INDUSTRIES INC.



16/499-0149
00-394-8817

VALLEY CITY (216) 483-3111 AKRON (216) 762-8715 CLEVELAND (216) 225-9275

LETTER OF TRANSMITTAL

DATE

9/26/95

ATTENTION

Sam

RE

O/W SEPERATOR @ CDF

ORDER SEPARATE COVER VIA

- ☐ SAMPLES
- ☐ LITERATURE
- ☐ PLANS
- ☐ PRINTS

- ☒ SHOP DRAWINGS
- ☐ ENGINEERING DRAWINGS
- ☐ CHANGE ORDERS
- ☐ LETTERS

- ☐ CONTRACTS
- ☐ OTHER

COPIES	DATE	NO	DESCRIPTION

THESE ARE BEING SENT:

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- ☐ FOR YOUR USE
- ☐ FOR YOUR REVIEW
- ☐ FOR YOUR COMMENTS
- ☐ FOR YOUR SIGNATURE
- ☐ FOR YOUR
- ☐ APPROVED AS NOTED
- ☐ APPROVED AS SUBMITTED
- ☐ APPROVED AS CHANGED
- ☐ REJECTED AS NOTED
- ☐ REJECTED AS CHANGED
- ☐ RETURNED FOR CORRECTIONS

- ☐ RESUBMIT _____ COPIES FOR APPROVAL
- ☐ SUBMIT _____ COPIES FOR DISTRIBUTION
- ☐ RENEW _____ COPIES FOR

NOTES THE PRODUCT SUBMITTALS APPROVED PROVIDED THAT ALL PROCESS COMPONENTS CAN HANDLE THE TEMP. AND COMPOSITION OF THE EFFLUENT. AS DISCUSSED WE WILL NEED SUBMITTALS FOR THE OIL RESISTANT GASKETS FOR THE DUCTILE IRON PIPE. ALSO I NEED REVISED DRAWINGS OF THE PROPOSED PIPING AND EQUIPMENT LAYOUT. DRAWINGS PL-1 AND M-1 WITH THE CORRECT ELEVATIONS AND REVISED PIPE LAYOUT ARE ALL THAT NEED TO BE SUBMITTED.

COPY TO

KEITH HOUSEKNECHT

RICK ZOLLINGER

SIGNATURE

Gene A Hill

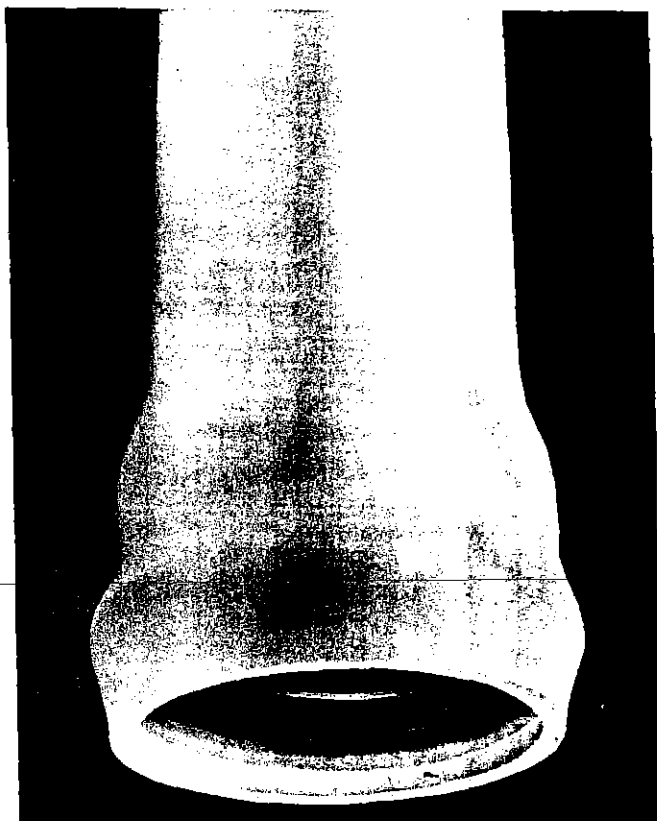
TITLE

DATE

9/26/95

CDF005916

WORKMAN TO PROVIDE
TEMPERATURE LIMITS
FOR ALL PIPING,
CONNECTIONS, AND THE
O/W OPERATOR



Designed for Installed-Cost Savings

Save in handling costs. Most sizes can be handled manually, so there is no need for costly installation equipment. Use the backhoe for excavating and backfilling only. Dig more trench, lay pipe faster, save more in costs per foot installed.

Easy Installation. Products should be installed in accordance with J-M Publication TR 533A, Ring-Tite® Installation Guide.

Save on fittings and thrust blocks. J-M Ring-Tite PVC pipe can be curved as shown in the table to eliminate many corners that would require elbows and bends. The costs of these items and labor are saved.

Min. Radil of Curvature

Size (in)	Radius (feet)
1½	38
2	50
2½	63
3	75
4	100
6	150
8	200
10	250
12	300

NOTE: Offsets were calculated assuming no deflection at the joint. The bent pipe is also assumed to form a true arc, i.e., pipe is curved uniformly throughout its length.

Description

Pipe conforms to ASTM 2241 for standard dimension ratios: 125 psi pipe - SDR 32.5; 160 psi pipe - SDR 26; 200 psi pipe - SDR 21. PVC compounds used in the extrusion of this pipe meets or exceeds the requirements of the material section of ASTM D 2241. Rubber rings conform to ASTM F 477.

Applications

Rural water, agricultural and turf irrigation pipelines. The pressure rating of the pipe—125 psi, 160 psi, or 200 psi—indicates the maximum allowable sustained pressure with a long-term 2 to 1 safety factor.

Meets Accepted Standards
NSF Standard 14

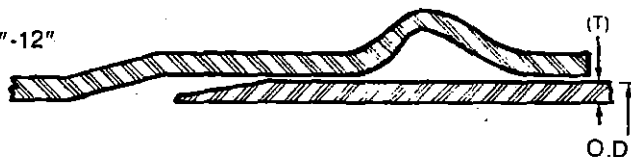
J-M Ring-Tite PVC pipes are manufactured in compliance with ASTM D2241 for pressure rated pipes.

	ASTM D2241		
Test	125 psi	160 psi	200 psi
Long Term Pressure Test 1000 hours	260	340	420
Quick Term Burst Test	400	500	630
Acetone Immersion Test A measure of proper fluxing and precise temperature control	20 min.	20 min.	20 min.
Flattening Test Tests extrusion quality and ductility under slow loading conditions.	60% in 2-5 min.	60% in 2-5 min.	60% in 2-5 min.

Pipe Dimensions

Ring Joint Design

Sizes 1½"-12"



Nominal Size	1½	2	2½	3	4	5*	6	8	10	12
O.D. (Average)	1.900	2.375	2.875	3.500	4.500	5.563	6.625	8.625	10.750	12.750
Min. Wall (125 psi)	0.060	0.073	0.088	0.108	0.138	0.171	0.204	0.265	0.331	0.392
Thickness, (160 psi)	0.073	0.091	0.110	0.135	0.173	0.214	0.255	0.332	0.413	0.490
(T), Ins. (200 psi)	0.090	0.113	0.137	0.167	0.214	0.265	0.316	0.411	0.511	0.606
Prox. Wt. Lbs. / Std. Length										
(125 psi)	4.7	7.1	10.4	15.5	25.5	38.6	55.9	94.0	147.0	207.3
(160 psi)	5.6	8.7	12.8	19.1	31.5	48.2	68.8	117.0	182.4	257.7
(200 psi)	6.8	10.7	15.8	23.4	38.7	59.3	84.5	143.7	224.0	316.4

All dimensions are in inches. Laying length for all sizes is 20' ± 1". O.D. dimensions conform to Iron Pipe Size (I.P.S.)

*5" not inventoried—Available only on special request.

Typical Physical and Chemical Properties and Capacities

Property	R-T PVC Pipe	ASTM Test Method	ASTM D 2241
ISO Hoop			
Stress at 73F			
Short Term Bursting Strength (PSI)		D1599	6,400
1,000 Hour Strength (PSI)		D1598	4,200
Working Pressure Rating			
73F (% of rating at 73F)	100%		
80F (% of rating at 73F)	88%		
100F (% of rating at 73F)	60%		
Chemical Resistance at 73F			
Acids	Excellent		
Salts—Bases	Excellent		
Aliphatic Hydrocarbons (including crude oil)	Good		
Physical Properties of Std. Test Specimens			
Tensile Strength (psi) at 73F		D638	7,000
Thermal Expansion (in./100 ft./50°F change)			
	2"		
Fire Resistance			
	Self Extinguishing		
Coefficient of Flow			
Williams-Hazen	C = 150		

CDF005918

HARCO Class 200 PVC Fittings

SIZES

Harco Class 200 Pressure Pipe Fittings will fit all IPS Pipe (Iron Pipe Size). IPS Pipe is available in SDR 21, Class 200; SDR 26, Class 160; Schedule 40 and Schedule 80. Harco offers a wide selection of sizes 1½" thru 8", and a full compliment of reducers, reducing tees, and adapters. Harco's large inventory assures you of fast and complete orders.

QUALITY

Harco Pressure Pipe Fittings are manufactured from virgin PVC material approved by the National Sanitation Foundation (NSF) for use in potable water systems. High strength and long serviceability is assured by rigorous and continuing quality control testing.

SUPERIOR CONSTRUCTION

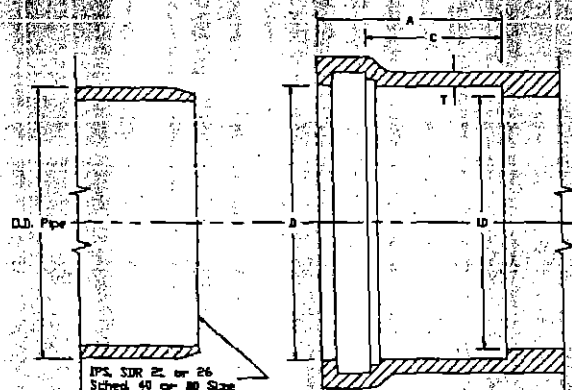
Harco's unique combination of one piece construction and heavy gasket design, assure the installer of a sure seal, backed by millions of installed, trouble free joints.

CLASS 200 PVC FITTINGS

ALL DIMENSIONS IN INCHES, WEIGHTS IN POUNDS

SUGGESTED SPECIFICATION

All fittings for Iron Pipe Size pipe shall be manufactured in one piece of injection molded PVC compound meeting ASTM D1784. Fittings shall be Class 200 and conform to requirements of DR 21. Fittings shall be designed to withstand a minimum of 630 psi quick burst pressure at 73 degrees F., tested in accordance with ASTM D1599. Bell shall be gasketed joint conforming to ASTM D3139 with gaskets conforming to ASTM F477. Push Joint or Mechanical Joint Ductile Iron fittings meeting AWWA C153 shall be allowed as alternative when PVC sizes are not available.



STANDARD JOINT DIMENSIONS
IN INCHES

Nominal Diameter	O.D. Pipe	A	C	D	T	ID
1½	1.900	3.168	2.418	1.938	0.107	1.720
2	2.375	3.273	2.523	2.413	0.133	2.149
2½	2.875	3.383	2.633	2.913	0.158	2.601
3	3.500	3.520	2.770	3.538	0.191	3.166
4	4.500	4.103	2.990	4.558	0.246	4.072
6	6.625	4.571	3.458	6.683	0.358	5.993
8	8.625	5.161	3.898	8.708	0.463	7.805

CDF005919

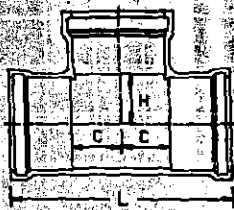
HARCO

THE HARRINGTON CORPORATION

P.O. Box 10335

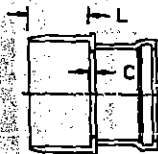
Lynchburg, Virginia 24506

(804) 845-7094



TEES

Cat. No.	Size	C	H	L	Wt
10333	8 x 8	4.6	4.8	19.3	21.3
10334	8 x 6	4.6	4.8	19.3	19.3
10335	8 x 4	4.6	4.8	19.3	18.7
10344	6 x 6	3.6	3.7	16.2	12.3
10345	6 x 4	3.6	3.7	16.2	11.0
10355	4 x 4	2.4	2.6	13.1	5.6
10356	4 x 3	2.4	2.6	13.1	4.9
10358	4 x 2	2.4	2.6	13.0	4.3
10366	3 x 3	2.0	2.2	10.9	2.8
10377	2.5 x 2.5	1.8	2.0	9.9	1.7
10388	2 x 2	1.4	1.5	9.2	1.4



REDUCER

Cat. No.	Size	L	C	Wt
10434	8 x 6	4.4	0.4	5.8
10445	6 x 4	3.8	0.4	2.7



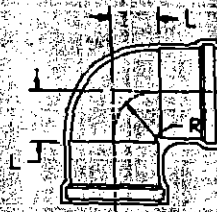
TAPPED TEE

Cat. No.	Size	L	Wt
1104x	6	1.3	5.8
1105x	4	1.3	3.1
1106x	3	3.0	2.5
1107x	2.5	1.9	1.5
1108x	2	2.7	1.2



SPIGOT ADAPTOR

Cat. No.	Size	L	OD	Wt
11260	3	2.0	3500	0.9
11270	2.5	2.0	2875	0.7
11280	2	1.3	2375	0.5
11290	1.5	1.1	1900	0.3



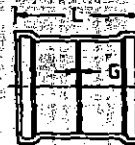
90 BEND

Cat. No.	Size	L	R	Wt
10530	8	4.5	4.2	16.3
10540	6	3.6	3.2	9.0
10550	4	2.5	2.2	3.8
10560	3	2.0	1.7	1.8
10570	2.5	1.6	1.4	1.3
10580	2	1.3	1.2	1.8



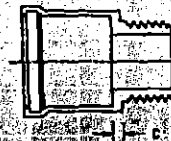
REDUCER
STYLE 2

Cat. No.	Size	L	R	Wt
10456	4 x 3	3.2	0.2	1.1
10457	4 x 2.5	3.2	0.2	1.2
10458	4 x 2	3.2	0.2	1.1
10467	3 x 2.5	3.8	0.2	0.8
10468	3 x 2	3.2	0.2	0.7
10478	2.5 x 2	3.6	0.1	0.6
10489	2 x 1.5	3.6	0.1	0.5



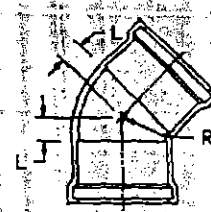
COUPLING

Cat. No.	Size	L	G	Wt
10130	8	11.1	25	10.3
10140	6	9.4	25	5.6
10150	4	8.4	19	2.7
10160	3	7.2	19	1.3
10170	2.5	7.0	19	0.9
10180	2	6.6	09	0.7
10190	1.5	6.4	09	0.5



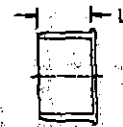
BELL x MPT ADAPTER

Cat. No.	Size	C	Wt
10740	6	7.8	10.3
10750	4	6.6	4.5
10760	3	2.3	1.5
10770	2.5	0.3	1.2
10780	2	0.4	0.5
10790	1.5	1.5	0.5



45 BEND

Cat. No.	Size	L	R	Wt
10630	8	2.0	4.2	13.3
10640	6	1.6	3.2	7.8
10650	4	1.1	2.2	3.4
10660	3	0.9	1.7	1.6
10670	2.5	0.7	1.4	1.1
10680	2	0.6	1.2	0.8



PLUG

Cat. No.	Size	L	Wt
10930	8	4.4	3.8
10940	6	3.6	2.3
10950	4	3.2	0.4
10960	3	3.1	0.4
10970	2.5	2.4	0.8
10980	2	2.8	0.2
10990	1.5	2.2	0.3



REPAIR COUPLING

Cat. No.	Size	L	Wt
10230	8	11.1	10.2
10240	6	9.4	5.5
10250	4	8.4	2.7
10260	3	7.2	1.3
10270	2.5	7.0	1.0
10280	2	6.6	0.7
10290	1.5	6.4	0.5

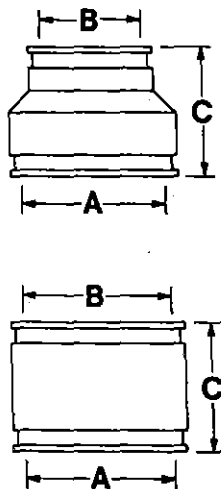


PE x MPT ADAPTER

Cat. No.	Size	A	C	Wt
10840	6	4.3	0.4	5.3
10850	4	3.4	0.4	2.0
10860	3	3.0	0.3	1.3
10870	2.5	2.5	0.3	0.8
10880	2	2.7	0.3	0.3
10890	1.5	2.7	0.3	0.3

Couplings

103/Clay to Asbestos Cement or Ductile Iron

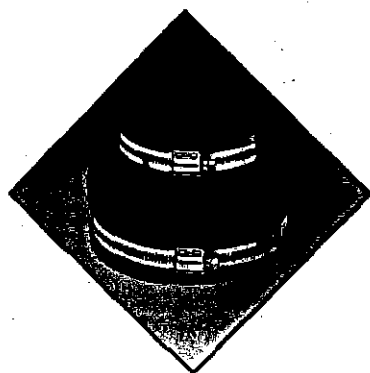


Part #	Pipe Size	A	B	C
103-44	4 x 4	5.30	4.75	4.00
103-54	5 x 4	6.40	4.75	5.00
103-55	5 x 5	6.40	5.90	6.00
*103-56	5 x 6	6.40	7.00	6.00
103-64	6 x 4	7.50	4.75	6.00
103-65	6 x 5	7.50	5.90	6.00
103-66	6 x 6	7.50	7.00	6.00
*103-68	6 x 8	7.50	9.12	6.00
103-86	8 x 6	9.75	7.00	6.00
103-88	8 x 8	9.75	9.12	6.00
103-1010	10 x 10	11.95	11.12	6.50
103-1212	12 x 12	14.50	13.20	6.50
103-1516	15 x 16	18.25	17.40	7.00
103-1818	18 x 18	21.50	19.50	9.00

104/Concrete to Concrete

Part #	Pipe Size	A	B	C
104-44	4 x 4	5.62	5.62	4.00
104-64	6 x 4	7.80	5.62	6.00
104-66	6 x 6	7.80	7.80	6.00
104-86	8 x 6	10.25	7.80	6.00
104-88	8 x 8	10.25	10.25	6.00
104-1010	10 x 10	13.00	13.00	7.00
104-1212	12 x 12	15.55	15.55	7.00
104-1515	15 x 15	19.50	19.50	9.00
104-1818	18 x 18	22.70	22.70	9.00
104-2121	21 x 21	26.20	26.20	9.00
104-2424	24 x 24	29.70	29.70	9.00
104-2727	27 x 27	33.20	33.20	9.00

106/Concrete to Cast Iron or Plastic



Part #	Pipe Size	A	B	C
*106-43	4 x 3	5.62	3.40	4.00
106-44	4 x 4	5.62	4.40	4.00
*106-63	6 x 3	7.80	3.40	6.00
106-64	6 x 4	7.80	4.40	6.00
106-66	6 x 6	7.80	6.40	6.00
106-86	8 x 6	10.25	6.40	6.00
106-88	8 x 8	10.25	8.55	6.00
106-1010	10 x 10	13.00	10.60	7.00
106-1212	12 x 12	15.55	12.60	7.00
106-1515	15 x 15	19.50	15.30	9.00
106-1818	18 x 18	22.70	18.70	11.25

* Supplied with reducer.

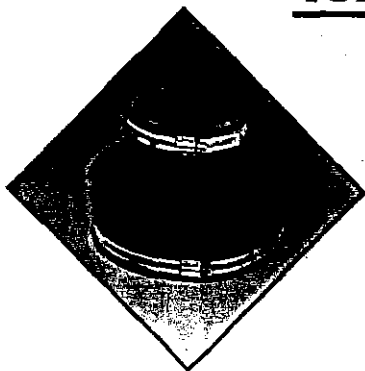
Couplings

Indiana Seal manufactures a complete line of couplings for clay, cast iron, ductile iron, concrete and plastic pipe, in sizes from 1 1/4" up to 27". Constructed of tough yet pliable PVC, these couplings are impervious to normal sewer gases, chemicals, fungus growth, various soil conditions, the menace of roots and all other associated in-ground hazards. Each coupling is produced and inspected under strict quality control standards to assure the highest degree of integrity at any junction in the line.

101/Clay to Clay

Part #	Pipe Size	A	B	C
101-44	4 x 4	5.30	5.30	4.00
*101-54	5 x 4	6.40	5.30	6.00
101-55	5 x 5	6.40	6.40	6.00
101-64	6 x 4	7.50	5.30	6.00
101-66	6 x 6	7.50	7.50	6.00
*101-85	8 x 5	9.75	6.40	6.00
101-86	8 x 6	9.75	7.50	6.00
101-88	8 x 8	9.75	9.75	6.00
101-1010	10 x 10	11.95	11.95	6.50
101-1212	12 x 12	14.50	14.50	6.50
101-1515	15 x 15	18.25	18.25	7.00
101-1818	18 x 18	21.50	21.50	7.00
101-2121	21 x 21	25.25	25.25	9.00
101-2424	24 x 24	28.50	28.50	9.00
101-2727	27 x 27	32.10	32.10	9.00
101-3030	30 x 30	35.00	35.00	9.00

102/Clay to Cast Iron or Plastic



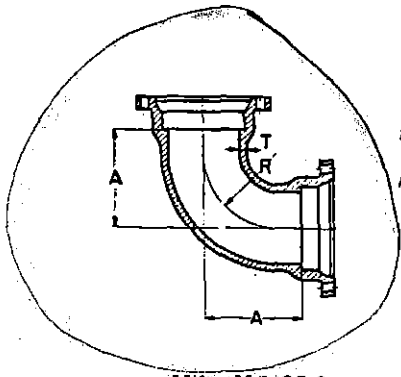
Part #	Pipe Size	A	B	C
102-43	4 x 3	5.30	3.40	4.00
102-44	4 x 4	5.30	4.40	4.00
*102-46	4 x 6	5.30	6.40	6.00
*102-53	5 x 3	6.40	3.40	6.00
*102-54	5 x 4	6.40	4.40	6.00
*102-55	5 x 5	6.40	5.50	6.00
*102-56	5 x 6	6.40	6.40	6.00
*102-63	6 x 3	7.50	3.40	6.00
102-64	6 x 4	7.50	4.40	6.00
102-65	6 x 5	7.50	5.50	6.00
102-66	6 x 6	7.50	6.40	6.00
*102-68	6 x 8	7.50	8.55	6.00
102-86	8 x 6	9.75	6.40	6.00
102-88	8 x 8	9.75	8.55	6.00
102-108	10 x 8	11.95	8.55	6.50
102-1010	10 x 10	11.95	10.60	6.50
102-1210	12 x 10	14.50	10.60	6.50
102-1212	12 x 12	14.50	12.60	6.50
102-1512	15 x 12	18.25	12.60	7.00
102-1515	15 x 15	18.25	15.30	7.00
102-1815	18 x 15	21.50	15.30	9.00
102-1818	18 x 18	21.50	18.70	9.00

*Supplied with reducer.

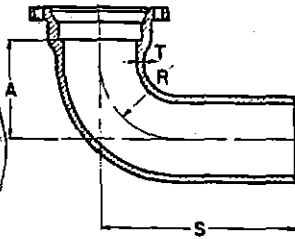
UNION FOUNDRY COMPANY

Specifications and Dimensions ANSI / AWWA C-110 / A21.10 MECHANICAL JOINT FITTINGS DUCTILE IRON

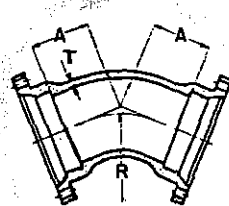
BENDS



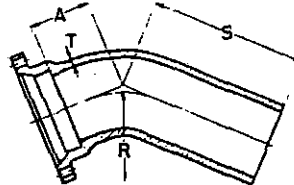
MJ x MJ 90°
21-0010



MJ x PE 90°
21-0120



MJ x MJ 45°
21-0510



MJ x PE 45°
21-0600

Size	Pressure Rating psi	Dimensions in Inches 90° Bends				Weight in Pounds *	
		T	R	A	S	MJ x MJ	MJ x PE
3	350	.48	4.0	5.5	13.5	35	35
4	350	.52	4.5	6.5	14.5	56	50
6	350	.55	6.0	8.0	16.0	85	80
8	350	.60	7.0	9.0	17.0	125	121
10	350	.68	9.0	11.0	19.0	197	190
12	350	.75	10.0	12.0	20.0	255	255
14	350	.82	11.5	14.0	22.0	380	413
16	350	.89	12.5	15.0	23.0	490	470
18	350	.96	14.0	16.5	24.5	625	600
20	350	1.03	15.5	18.0	26.0	938	886
24	350	1.16	18.5	22.0	30.0	1215	1260
30	250	1.03	21.5	25.0	33.0	1690	1585
36	250	1.15	24.5	28.0	36.0	2629	2310

Size	Pressure Rating psi	Dimensions in Inches 45° Bends				Weight in Pounds *	
		T	R	A	S	MJ x MJ	MJ x PE
3	350	.48	3.62	3.0	11.0	30	30
4	350	.52	4.81	4.0	12.0	50	45
6	350	.55	7.25	5.0	13.0	83	70
8	350	.60	8.44	5.5	13.5	110	105
10	350	.68	10.88	6.5	14.5	155	155
12	350	.75	13.25	7.5	15.5	215	229
14	350	.82	12.06	7.5	15.5	300	280
16	350	.89	13.25	8.0	16.0	442	360
18	350	.96	14.50	8.5	16.5	548	445
20	350	1.03	16.88	9.5	17.5	575	664
24	350	1.16	18.12	11.0	19.0	865	825
30	250	1.03	27.75	15.0	23.0	1480	1275
36	250	1.15	35.00	18.0	26.0	2435	1930

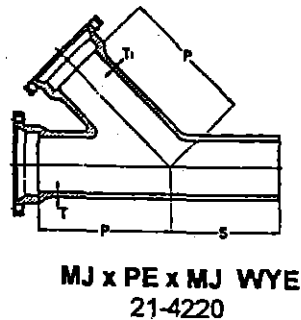
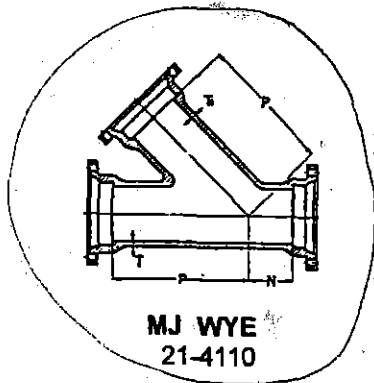
* Weight does not include accessories weight or cement lining weight.

NOTE: Furnished with mechanical joint bell on all openings unless ordered otherwise.

UNION FOUNDRY COMPANY

Specifications and Dimensions MECHANICAL JOINT FITTINGS DUCTILE IRON Manufacturer's Standard

WYES



Size		Pressure Rating psi	Dimensions in inches					Weight in Pounds*	
Run	Branch		T	T1	N	P	S	ALL MJ	MJ x PE x MJ
3	3	NR	.48	.48	3.0	10.0	11.0	60	72
4	3	NR	.52	.48	3.0	12.0	-	80	-
4	4	NR	.52	.52	3.0	12.0	11.0	90	85
6	3	NR	.55	.48	3.5	14.5	11.5	120	115
6	4	NR	.55	.52	3.5	14.5	11.5	130	125
6	6	NR	.55	.55	3.5	14.5	11.5	145	140
8	3	NR	.60	.48	4.5	17.5	12.5	180	185
8	4	NR	.60	.52	4.5	17.5	12.5	190	185
8	6	NR	.60	.55	4.5	17.5	12.5	205	200
8	8	NR	.60	.60	4.5	17.5	12.5	230	185
10	4	NR	.68	.52	5.0	20.5	13.0	270	270
10	6	NR	.68	.55	5.0	20.5	13.0	335	285
10	8	NR	.68	.60	5.0	20.5	13.0	310	310
10	10	NR	.68	.68	5.0	20.5	13.0	435	340
12	4	NR	.75	.52	5.5	24.5	-	380	-
12	6	NR	.75	.55	5.5	24.5	13.5	400	400
12	8	NR	.75	.60	5.5	24.5	13.5	505	425
12	10	NR	.75	.68	5.5	24.5	13.5	450	450
12	12	NR	.75	.75	5.5	24.5	13.5	490	490
14	6	NR	.82	.55	6.0	27.0	14.0	626	555
14	8	NR	.82	.60	6.0	27.0	-	595	-
14	10	NR	.82	.68	6.0	27.0	-	625	-
14	12	NR	.82	.75	6.0	27.0	14.0	670	670
14	14	NR	.82	.82	6.0	27.0	-	803	-
16	6	NR	.89	.55	6.5	30.0	14.5	735	715
16	8	NR	.89	.60	6.5	30.0	14.5	760	735
16	10	NR	.89	.68	6.5	30.0	-	800	-
16	12	NR	.89	.75	6.5	30.0	14.5	835	815
16	14	NR	.89	.82	6.5	30.0	-	900	-
16	16	NR	.89	.89	6.5	30.0	14.5	1079	940

NR Wyes are not included in AWWA C-110 Specifications. Contact Manufacturer for pressure rating for specific application.

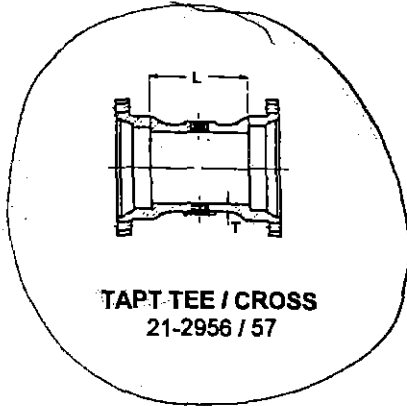
* Weights do not include accessories or cement lining weights.

UNION FOUNDRY COMPANY

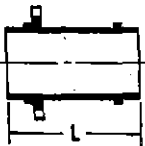
Specifications and Dimensions AWWA C-110 MECHANICAL JOINT FITTINGS DUCTILE IRON

TAPPED TEES and CROSSES

(TWO BOSSES CAN BE USED TO MAKE A TAPPED CROSS)

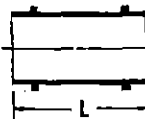


Size	Pressure Rating psi	Dimensions in inches		Maximum Tap in Boss (inches)	Weight in pounds*
		T	L		
3	350	.48	8.0	2½	35
4	350	.52	8.0	2½	45
6	350	.55	8.0	2½	70
8	350	.60	8.0	2½	116
10	350	.68	8.0	2½	145
12	350	.75	8.0	2½	185
14 **	350	.82	8.0	2½	272
16 **	350	.89	8.0	2½	329
18 **	350	.96	8.0	2½	480
20 **	350	1.03	8.0	2½	420
24 **	350	1.16	8.0	2½	555



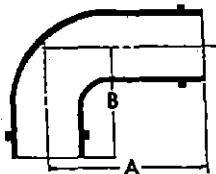
HYDRANT ADAPTERS ** (Anchor Couplings) Manufacturer's Standard

SWIVEL x SOLID 21-4660



SWIVEL x SWIVEL 21-4665

Size	Pressure Rating psi	Length - inches		Weight in pounds	
		SWIVEL x SOLID	SWIVEL x SWIVEL	SWIVEL x SOLID	SWIVEL x SWIVEL
4 x 13	350	12.5	-	66	-
4 x 18	350	18	-	75	-
4 x 24	350	24	-	90	-
6 x 12	350	12	12	66	57
6 x 13	350	12.5	-	67	-
6 x 18	350	18	18	79	71
6 x 24	350	24	-	90	-
6 x 36	350	36	-	139	-
8 x 13	350	12.5	-	113	-



SWIVEL x SWIVEL 90° BEND 21-0460

SWIVEL x SWIVEL 90° BEND ** Manufacturer's Standard

Also referred to as MJ Anchoring Elbow, this bend combines two Swivel x Swivel adapters and a 90° Bend. The two different laying lengths allow hydrants to be placed at either of two distances parallel to the main. Manufactured in 6" size only. Weight is 92 pounds including hydrant glands (2).

* Weights do not include accessories or cement lining weights.

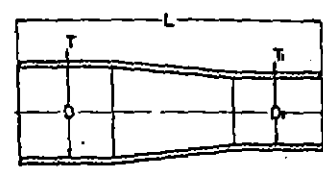
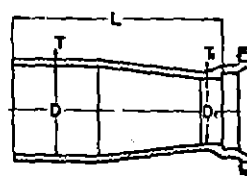
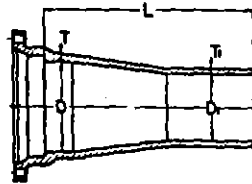
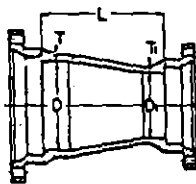
** Not included in AWWA C-110. Produced to Manufacturer's Standards.

UNION FOUNDRY COMPANY

Specifications and Dimensions

AWWA C-110 MECHANICAL JOINT FITTINGS DUCTILE IRON

REDUCERS



MJ x MJ
21-3510

Large End MJ
21-3700

Small End MJ
21-3710

PE x PE
21-3780

Size		E C C	Pressure Rating psi	Thickness inches		L-Laying Length (in)				Weight in Pounds*			
D	D1			T	T1	MJ x MJ	Large End MJ	Small End MJ	PE x PE	MJ x MJ	Large End MJ	Small End MJ	PE x PE
3	2**		350	.48	.35	6.0	8.5	8.5	22.0	24	25	17	26
4	2**		350	.52	.35	7.0	9.5	9.5	23.0	31	30	16	25
4	3		350	.52	.48	7.0	15.0	15.0	23.0	45	40	40	36
6	2**	M	350	.55	.35	9.0	9.5	9.5	-	44	38	28	-
6	3	M	350	.55	.48	9.0	17.0	17.0	25.0	55	55	50	50
6	4	M	350	.55	.52	9.0	17.0	17.0	25.0	60	60	60	55
8	3**	M	350	.60	.48	11.0	19.0	19.0	27.0	85	75	70	70
8	4	MS	350	.60	.52	11.0	19.0	19.0	27.0	87	80	86	75
8	6	MLSP	350	.60	.55	11.0	19.0	19.0	27.0	95	90	90	85
10	3**		350	.68	.48	12.0	-	20.0	-	100	-	95	-
10	4	M	350	.68	.52	12.0	20.0	20.0	28.0	105	100	100	100
10	6	MSP	350	.68	.55	12.0	20.0	20.0	28.0	130	115	115	115
10	8	MS	350	.68	.60	12.0	20.0	20.0	28.0	135	130	130	130
12	4	MS	350	.75	.52	14.0	22.0	22.0	30.0	135	130	130	130
12	6	MLS	350	.75	.55	14.0	22.0	22.0	30.0	174	151	150	145
12	8	MLSP	350	.75	.60	14.0	22.0	22.0	30.0	182	165	183	179
12	10	M	350	.75	.68	14.0	22.0	22.0	30.0	220	185	210	204
14	6	S	350	.82	.55	16.0	24.0	24.0	32.0	200	200	185	185
14	8	M	350	.82	.60	16.0	24.0	24.0	32.0	220	220	205	205
14	10	M	350	.82	.68	16.0	24.0	24.0	32.0	245	245	230	230
14	12	L	350	.82	.75	16.0	24.0	24.0	32.0	270	275	255	260
16	6	LSP	350	.89	.55	18.0	26.0	26.0	34.0	250	250	230	230
16	8	M	350	.89	.60	18.0	26.0	26.0	34.0	270	270	250	250
16	10	ML	350	.89	.68	18.0	26.0	26.0	34.0	300	300	298	280
16	12	MLSP	350	.89	.75	18.0	26.0	26.0	34.0	371	386	305	335
16	14	MS	350	.89	.82	18.0	26.0	26.0	34.0	370	355	350	335

M - MJ x MJ also available in Eccentric.

L - LEMJ also available in Eccentric.

S - SEMJ also available in Eccentric.

P - PE x PE also available in Eccentric.

* Weights do not include accessories or cement lining weights.

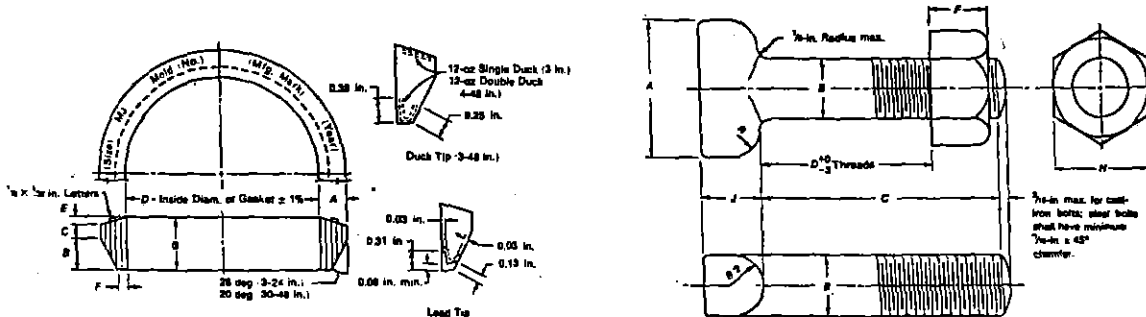
** Not included in AWWA C-110. Produced to Manufacturer's Standards.

UNION FOUNDRY COMPANY

Specifications and Dimensions

ANSI / AWWA C-110 / A21.10 MECHANICAL JOINT FITTINGS ANSI / AWWA C-111 / A21.11 RUBBER GASKET JOINTS FOR FITTINGS DUCTILE IRON

GASKETS, BOLTS and NUTS FOR MECHANICAL JOINTS



MECHANICAL JOINT GASKET

MECHANICAL JOINT BOLTS and NUTS

Pipe Size	Pipe OD	Mechanical Joint Gasket Dimensions in inches						
		A (±0.01)	B	C	D (±1.0%)	E (±0.01)	F (±0.01)	G (±0.02)
3	3.96	.48	.62	.31	3.86	.12	.15	1.05
4	4.80	.62	.75	.31	4.68	.16	.22	1.22
6	6.90	.62	.75	.31	6.73	.16	.22	1.22
8	9.05	.62	.75	.31	8.85	.16	.22	1.22
10	11.10	.62	.75	.31	10.87	.16	.22	1.22
12	13.20	.62	.75	.31	12.95	.16	.22	1.22
14	15.30	.62	.75	.31	14.99	.16	.22	1.22
16	17.40	.62	.75	.31	17.07	.16	.22	1.22
18	19.50	.62	.75	.31	19.13	.16	.22	1.22
20	21.60	.62	.75	.31	21.20	.16	.22	1.22
24	25.80	.62	.75	.31	25.34	.16	.22	1.22
30	32.00	.73	1.00	.38	31.47	.16	.37	1.54
36	38.30	.73	1.00	.38	37.67	.16	.37	1.54

NOTE: Tipped or backed gaskets may be made in the same mold as plain rubber gaskets, but the inside diameter of such reinforced portions shall not exceed the "pipe OD". The duck for tips and backs shall be frictioned before molding.

Nominal Size	T - Head Cor-ten (Low alloy steel) Bolts and Nuts Dimensions in inches								
	A (±.05)	B (±.03)	C (+.25-.06)	D	E*	F	H	J (+.15-.03)	R Max.
5/8 x 3	1.50	.625	3.0	1.50	11	.625±.04	1.062-.04	.625	.312
3/4 x 3 1/2	1.75	.750	3.5	1.50	10	.750±.06	1.250-.06	.750	.375
3/4 x 4	1.75	.750	4.0	2.25	10	.750±.06	1.250-.06	.750	.375
3/4 x 4 1/2	1.75	.750	4.5	2.50	10	.750±.06	1.250-.06	.750	.375
3/4 x 5	1.75	.750	5.0	3.00	10	.750±.06	1.250-.06	.750	.375
1 x 6	2.25	1.000	6.0	3.75	8	1.000±.08	1.625-.08	1.00	.500

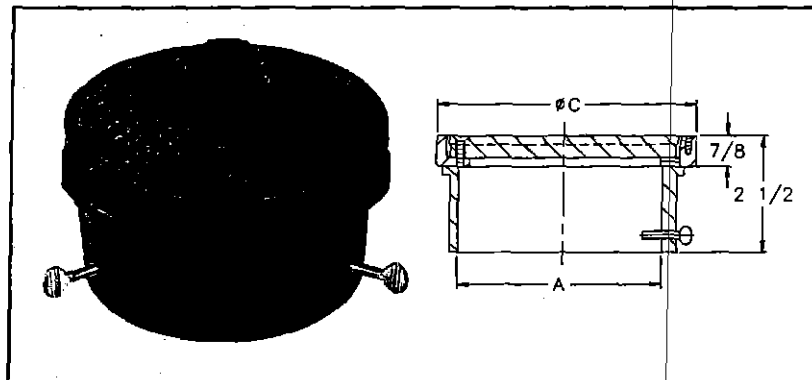
* Number of threads per inch [Coarse-Thread Series (ANSI B1.1 - Unified Standard for Screw Threads) Class 2A, External Fit UNC2A and Class 2B, (ANSI B1.2 - Standard for Gages and Gaging)].

NOTE: Dimension "B" is unthreaded shank. Dimension "D" is measured to face of nut run up finger tight. Draft, when required to be 6 degree maximum, may be deducted from bolt head dimensions, and radius (B/2) may be changed to suit draft. Gates, if required, may protrude a maximum of 1/8 inch above the top of the bolt head.

CLEANOUTS



Z-1404 FLOOR ACCESS HOUSING



Dimensions In Inches		App. Wt. Lbs.
A Pipe Size	C	
2	5-1/8	2
3	6-1/8	3
4	7-1/4	4
5	8-1/4	7
6	9-1/4	8

ENGINEERING SPECIFICATION: ZURN Z-1404 Floor access housing, Dura-coated cast iron with round frame and scoriated secured cover complete with adjusting set screws.

OPTIONS

ACCESS HOUSING (Specify pipe size in inches and type of outlet)

CONNECTION TYPE	CONNECTION DESIGNATION Pipe Size/Outlet Type
Slip Joint	2SJ, 3SJ, 4SJ, 5SJ, 6SJ

PREFIXES (See chart for pricing)

- Z- D.C.C.I. Body and Top*
- ZB- D.C.C.I. Body with Polished Bronze Top
(Deduct 1/2" from 7/8" Dim.)
- ZN- D.C.C.I. Body with Polished Nickel Bronze Top
(Deduct 1/2" from 7/8" Dim.)

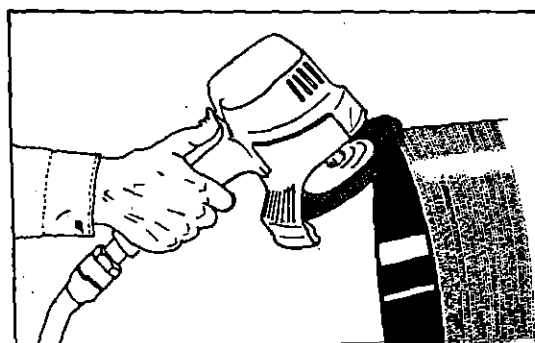
The Backhoe Method of Assembly

A backhoe may be used to assemble pipe of intermediate and larger sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to push the pipe until fully seated. A timber header should be used between the pipe and backhoe bucket to avoid damage to the pipe.

Field Cut Pipe

Figure 11

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about $\frac{1}{4}$ -inch at an angle of about 30 degrees (Figure 11). This can be quite easily done with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.



Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches	Approximate Radius in Feet of Curve Produced by Succession of Joints
		18 ft. Length	18 ft. Length
4	5°	19	206
6	5°	19	206
8	5°	19	206
10	5°	19	206
12	5°	19	206
14	5°	19	206
16	5°	19	206
18	5°	19	206
20	5°	19	206
24	5°	19	206
30	5°	19	206
36	5°	19	206
42	4°	17*	286*
48	4°	17*	286*
54	4°	17*	286*

*20-foot length

Thicknesses, Dimensions and Weights of Ductile Iron TYTON JOINT® Pipe

Thicknesses, dimensions and weights of 4" through 54" Ductile Iron pipe conforming to ANSI/AWWA C151/A21.51.

Size Inches	Thickness Class	Thickness	Outside Diameter*	18-Foot Laying Length	
				Weight Per Length†	Avg. Weight Per Foot ††
		Inches		Pounds	
4	51	0.26	4.80	215	11.9
	52	0.29	4.80	235	13.1
	53	0.32	4.80	260	14.3
	54	0.35	4.80	280	15.6
	55	0.38	4.80	300	16.7
	56	0.41	4.80	320	17.8
6	50	0.25	6.90	305	16.9
	51	0.28	6.90	340	18.7
	52	0.31	6.90	370	20.5
	53	0.34	6.90	400	22.3
	54	0.37	6.90	435	24.1
	55	0.40	6.90	470	25.9
	56	0.43	6.90	500	27.6
8	50	0.27	9.05	430	23.9
	51	0.30	9.05	475	26.4
	52	0.33	9.05	520	28.9
	53	0.36	9.05	565	31.3
	54	0.39	9.05	605	33.7
	55	0.42	9.05	645	35.9
	56	0.45	9.05	690	38.4
10	50	0.29	11.10	570	31.6
	51	0.32	11.10	625	34.7
	52	0.35	11.10	680	37.7
	53	0.38	11.10	735	40.7
	54	0.41	11.10	785	43.6
	55	0.44	11.10	840	46.6
	56	0.47	11.10	890	49.5
12	50	0.31	13.20	725	40.2
	51	0.34	13.20	790	43.8
	52	0.37	13.20	855	47.4
	53	0.40	13.20	920	51.1
	54	0.43	13.20	985	54.6
	55	0.46	13.20	1045	58.1
	56	0.49	13.20	1110	61.7

*Tolerance of O.D. of spigot end: 4-12 in., ± 0.06 in.; 14-24 in., $+0.05$ in., -0.08 in.; 30-54 in., $+0.08$ in., -0.06 in.

†Including bell; calculated weight of pipe rounded off to nearest 5 lb.

††Including bell; average weight, per foot, based on calculated weight of pipe before rounding.

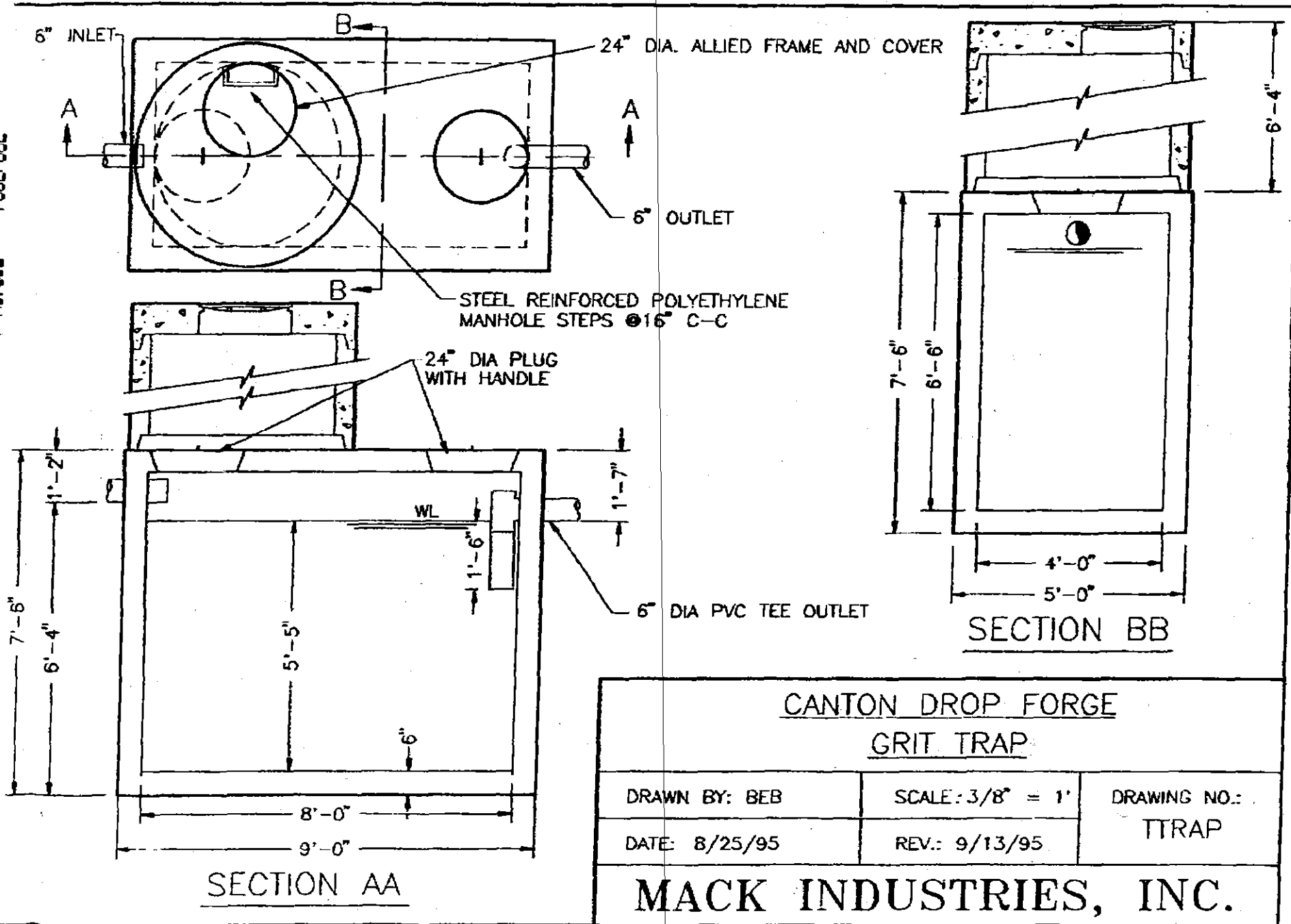
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Thickness Class for each Rated Working Pressure of Ductile Iron Pipe

Standard Thickness Classes for Working Pressure plus 100 psi Surge Allowance*

Pipe Size Inches	Working Pressures (psi)				
	150	200	250	300	350
4	51	51	51	51	51
6	50	50	50	50	50
8	50	50	50	50	50
10	50	50	50	50	50
12	50	50	50	50	50
14	50	50	50	50	50
16	50	50	50	50	50
18	50	50	50	50	50
20	50	50	50	50	51
24	50	50	50	51	52
30	50	50	51	52	53
36	50	50	51	52	53
42	50	50	51	52	53
48	50	50	51	52	53
54	50	50	51	52	53

*Design Pressure = Working pressure as listed above plus 100 psi surge allowance \times 2.0 safety factor.



CANTON DROP FORGE
GRIT TRAP

DRAWN BY: BEB

SCALE: 3/8" = 1'

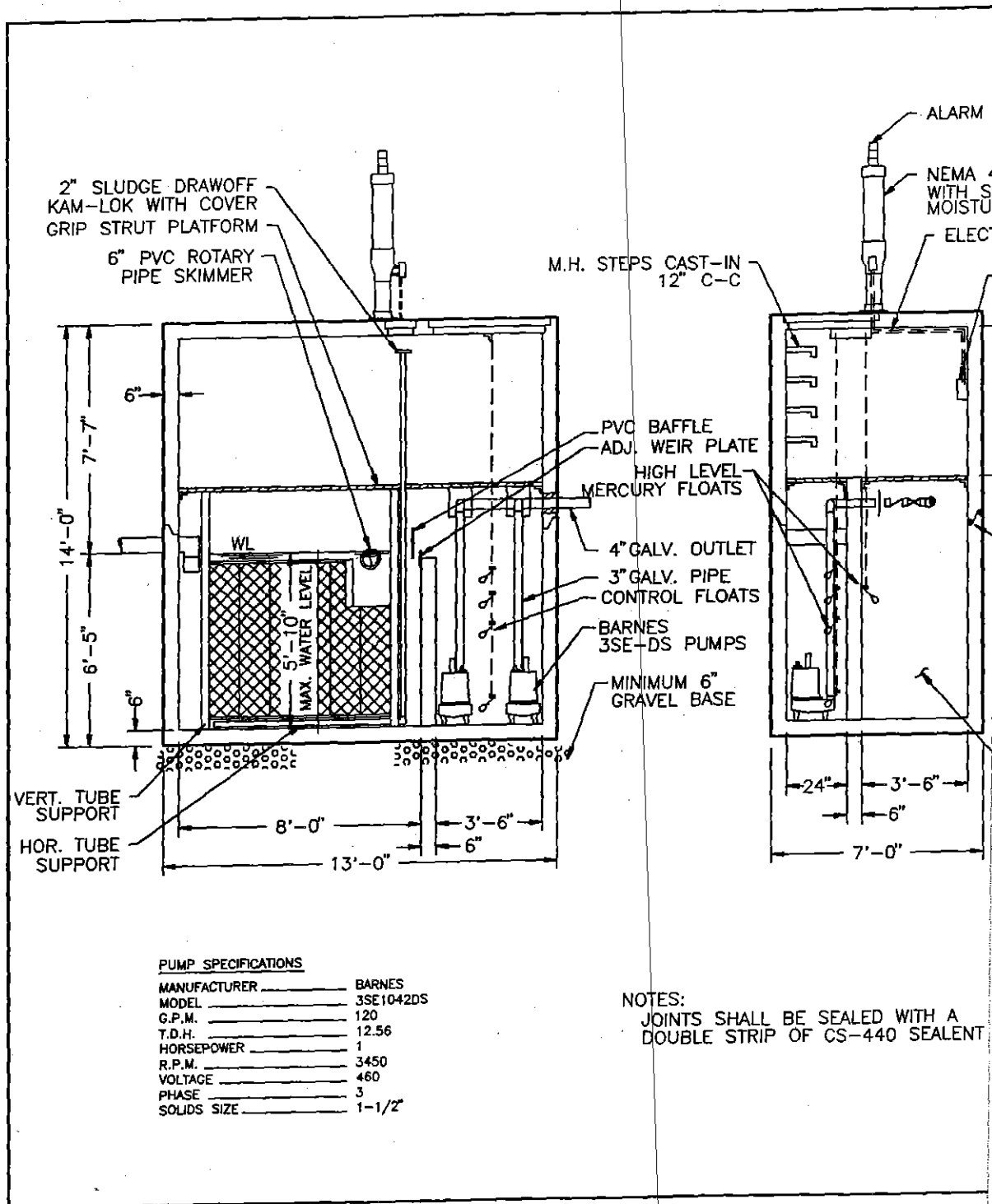
DRAWING NO.:

DATE: 8/25/95

REV.: 9/13/95

TTRAP

MACK INDUSTRIES, INC.



8-14-95 FIELD DATA

1% FALL IN DRAIN PIPE

From 10" Clay to Separator (150' ±)

SEPARATOR AREA
GROUND EL.

-1.52 ±



2" CLAY DIE LUBE DRAIN

- 5.73



10" CLAY DRAIN

-5.92

Copper
Building Wire Products
Catalog Section 1
Data Page 1

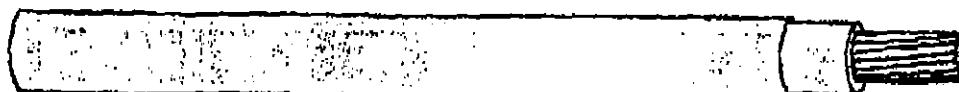
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MADE
IN THE
USA

THHN

Thermoplastic Insulated, Nylon Sheathed.
Heat, Moisture, Oil & Gasoline Resistant.
600 volt. Copper.

Also rated THWN & MTW in all sizes, 105° C AWM in sizes 14-6 AWG.



APPLICATIONS

Southwire Type THHN or THWN or MTW conductors may be used as specified in the National Electrical Code at conductor temperatures not to exceed 60°C when exposed to oil or coolant, 75°C in wet locations, 90°C in dry locations. Conductor temperatures not to exceed 105°C in dry locations when rated AWM and used as appliance wiring material. Voltage rating for all applications is 600 volts.

SPECIFICATIONS

Southwire Type THHN or THWN or MTW (also AWM) meets or exceeds UL standard 83, UL standard 1063 (MTW), Federal Specification JC-C-30A, and requirements of the National Electrical Code.

CONSTRUCTION

Southwire Type THHN or THWN or MTW copper conductors are annealed (soft) copper, insulated with a tough, heat and moisture resistant polyvinyl chloride (PVC), over which a nylon (polyamide) jacket is applied. AWG 14 through AWG 6, 19 strand, may be rated AWM for appliance wiring material. Available in black, white, red, blue, green, yellow, brown, orange, or grey. Some colors standard, some subject to economic order quantity. Sizes 1-19 through 1,000 KCM available in black only.

1987 Edition.

**SOUTHWIRE
COMPANY**

CDF005935

APPROVED
GCH
10/14/95
UL

THHN-586

© 1987

CONDUCTOR		INSULATION THICKNESS (MILS)	JACKET THICKNESS (MILS)	NOMINAL O.D. (MILS)		APPROX NET WEIGHT PER 1000' (LBS.)		AMPACITY*			STANDARD PACKAGE
SIZE (AWG or KCM)	NO. STRANDS			SOL.	STR.	SOL.	STR.	60°C MTW ¹	75°C THWN	90°C THHN	
14	19	16	4	102	110	15	16	15	15	15	DNF ²
12	19	16	4	110	128	23	24	20	20	20	DNF
10	19	20	4	150	183	37	38	30	30	30	DPF ³
8	19	30	5		211		62	40	50	55	F
6	19	30	5		247		94	55	65	75	E
4	19	40	6		320		151	70	85	85	C
2	19	40	6		379		232	95	115	130	C
1	19	50	7		438		297	110	130	150	B
1/0	19	50	7		478		369	125	150	170	B
2/0	19	60	7		520		468	145	175	195	B
3/0	19	60	7		570		570	165	200	225	B
4/0	19	60	7		628		711	195	230	260	B
250	37	60	8		694		849	215	255	290	B
300	37	60	8		747		1009	240	285	320	B
350	37	60	8		797		1170	260	310	350	B
400	37	60	8		842		1329	280	335	380	B
500	37	60	8		925		1648	320	380	430	B
600	61	70	9		1026		1887	355	420	475	C
750	61	70	9		1126		2484	400	475	535	C
1000	61	70	9		1275		3257	455	545	615	C

*Solid construction available in sizes 14, 12, & 10 as Types THHN or THWN only.

**Also suitable for 105°C appliance wiring material (AWM).

¹Per NFPA Standard No. 70, 1980 edition.

²Four 500' spools per carton.

³Two 500' spools per carton.

⁴Ampacities shown are for not more than 3 single conductors in raceway in free air per table 310-15 of the National Electrical Code, 1987 edition. For other applications refer to applicable tables 310-17 through 310-25.

STANDARD PACKAGE CODE:

B — 1000' Reel

C — 500' Reel

E — 1000' Spool

F — 500' Spool

N — 2000' Carton

O — 1000' Carton

D — 2500' Spool

THHN or THWN or MTW

RECOMMENDED SAMPLE SPECIFICATION: (MTW or THHN or THWN)

Conductors shall be UL Type "MTW or THHN or THWN," suitable for operations at 600 volts, as specified in the National Electrical Code, at conductor temperatures not to exceed 90°C when exposed to oil or coolant, 90°C in dry locations. Conductors shall be annealed copper, insulated with high-heat and moisture resistant PVC, jacketed with abrasion, moisture, gasoline, and oil resistant nylon, as manufactured by Southwire Company or approved equal.

(AWM)

Conductors shall be UL Type "THHN or THWN or MTW or AWM," suitable for operation at 600 volts, as specified in the National Electrical Code, at conductor temperatures not to exceed 105°C in dry locations. Conductors shall be annealed copper, insulated with high-heat and moisture resistant PVC, jacketed with abrasion, moisture, gasoline, and oil resistant nylon, as manufactured by Southwire Company or approved equal.

FOR ADDITIONAL INFORMATION

For additional information on this or any other Southwire product, contact your Southwire representative, or Southwire Company, Distributor Sales, in Carrollton, Georgia.

**SOUTHWIRE
COMPANY**

Carrollton, Georgia 30119-0001
404/832-4242 • Telex 54-2799

CDF005936

ALLIED'S IMC

QUALITY, LONG-LASTING INTERMEDIATE METAL CONDUIT

QUALITY ENGINEERED FOR FULL ELECTRICAL SYSTEM PROTECTION

Allied IMC is precision-manufactured for economical protection and long-lasting value for the electrical raceway system. Allied IMC is lighter in weight but as strong as RIGID, and is recognized for use in every application, without exception, including all hazardous locations. Allied IMC is manufactured from premium, work-hardened steel combining electrical and mechanical performance with ductility. Allied IMC is resistant to impact and is easy to cut, bend and join for smooth, continuous raceways and fast wire-pulling. Allied IMC also provides radiation protection and magnetic shielding.

After cleaning, the exterior of Allied IMC is hot-dip zinc galvanized using Allied's patented FLO-COAT® process. Then it is chromated and lacquered to form a triple protection layer against corrosion and abrasion.

The interior of Allied IMC is coated with a highly corrosion-resistant lubricating finish for easier wire-pulling. No need to worry about damage to the conduit system even when pulling through multiple 90° bends. Both interior and exterior coatings meet U.L. 1242 and ANSI C80.6.

THE ALLIED IMC ADVANTAGE

Allied IMC has a larger internal diameter than RIGID conduit to allow for easier fishing and wire-pulling. Allied IMC is also more "rigid" than RIGID to provide superior wiring protection in many applications. The National Electrical Code recognizes Allied IMC for the same uses as RIGID, including all hazardous (classified) applications.

Allied IMC uses the same threaded fittings as RIGID conduit, and the 1/2" NPT threads (ANSI B1.20.1) are also full cut and galvanized after cutting.

Color-coded end-cap thread protectors keep the threads clean and sharp, and also provide instant trade size recognition. Even-inch sizes are color-coded orange, 1/2-inch sizes are yellow, and 3/4-inch sizes are green.

FULL CODES AND STANDARDS COMPLIANCE

Allied IMC is U.L. listed and is recognized by the National Electrical Code. It meets Underwriters Laboratories' Standards for IMC, U.L. 1242. Allied IMC is also manufactured to meet the requirements of ANSI C80.6 and Federal Specifications. Federal Specifications now use U.L. 1242 in lieu of WWC 581. Recognized as an equipment grounding conductor (NEC Article 250-9(b)).

To specify Allied IMC, include the following: Conduit shall be galvanized Intermediate Metal Conduit equal to that manufactured by Allied Tube & Conduit Corporation. All threads shall be galvanized after cutting. The conduit shall bear the U.L. label and shall conform to U.L. 1242 and ANSI C80.6.

Installation of Intermediate Metal Conduit shall be in accordance with the National Electrical Code and U.L. General Information card #DYBY.

KWIK-COUPLE IMC - A NEW INNOVATION FROM THE CONDUIT LEADER

Allied's new patented Kwik-Couple IMC has a factory-installed Kwik-Couple coupling threaded onto one end of each conduit length or elbow. The Kwik-Couple performs like a 3-piece coupling, threading securely onto both lengths of conduit at each connection by wrench-tightening the coupling - instead of turning the conduit.

Specifying U.L. listed Kwik-Couple IMC insures IMC conduit reliability and performance, as well as economy. Contact Allied for detailed specifications on Kwik-Couple IMC.

1/4 in. and 1/2 in. are produced from hot-dip galvanized steel and do not have the clear lacquer coating.

† U.S. Patent Numbers 4289535, 4347004.

WEIGHTS AND DIMENSIONS FOR INTERMEDIATE METAL CONDUIT

Trade Size, inches	Approx. Wt. per 100 ft. (30.5m)		Nominal Outside Dia.*		Nominal Wall Thickness†		Length of Finished Conduit‡		Quantity in Primary Bundle		Quantity in Master Bundle		Approx. Wt. of Master Bundle		Volume of Master Bundle	
	lb	kg	in	mm	in	mm	ft & in	m	ft	m	ft	m	lb	kg	cu ft	cu m
1/2	80	27.23	0.815	20.7	0.070	1.8	9'11 1/2"	3.03	100	30.48	2,500	762	1,500	680	19.0	.54
3/4	82	37.29	1.028	26.1	0.075	1.9	9'11 1/4"	3.03	50	15.24	2,000	610	1,840	744	26.7	.78
1	116	52.62	1.290	32.8	0.085	2.2	9'11"	3.02	50	15.24	1,300	396	1,508	684	22.9	.65
1 1/4	150	68.04	1.638	41.6	0.085	2.2	9'11"	3.02	30	9.14	800	274	1,350	612	26.7	.76
1 1/2	182	82.55	1.893	47.8	0.090	2.3	9'11"	3.02	—	—	800	244	1,456	660	28.9	.82
2	242	109.77	2.380	59.8	0.095	2.4	9'11"	3.02	—	—	600	183	1,452	659	33.0	.93
2 1/2	428	194.14	2.857	72.6	0.130	3.3	9'10 1/2"	3.01	—	—	400	122	1,712	777	29.2	.83
3	526	238.59	3.416	86.3	0.130	3.3	9'10 1/2"	3.01	—	—	300	91	1,578	716	30.4	.86
3 1/2	612	277.50	3.971	100.9	0.130	3.3	9'10 1/2"	3.00	—	—	250	76	1,530	694	36.3	1.03
4	682	309.35	4.468	113.4	0.130	3.3	9'10 1/2"	3.00	—	—	200	61	1,364	619	32.8	.93

* Outside diameter tolerances: +/- .006 in. (.15 mm) for trade sizes 1/2 in. through 1 in.; +/- .0075 in. (.19 mm) for trade sizes 1 1/4 in. through 2 in.; +/- .010 in. (.25 mm) for trade sizes 2 1/2 in. through 4 in.
† Wall thickness tolerances: +/- .014 in. (.36 mm) and +/- .000 for trade sizes 1/2 in. through 2 in.; +/- .020 in. (.51 mm) and +/- .000 for trade sizes 2 1/2 in. through 4 in.
‡ Without Coupling. Length tolerances: +/- .25 in. (6.35 mm).

 **Allied**
TUBE & CONDUIT
ELECTRICAL
16100 South Lathrop
Harvey, Illinois 60426
(312) 937-8833
a GAFOR Company

From : MARTELL ELECTRIC CO. INC. 733-8832

P01

1(c)(d)(e)

MARTELL ELECTRIC CO., INC.
1605 Canton Road, Suite B
Akron, Ohio 44312
733-8861
Fax 733-8832

To: *Sam Schaefer*

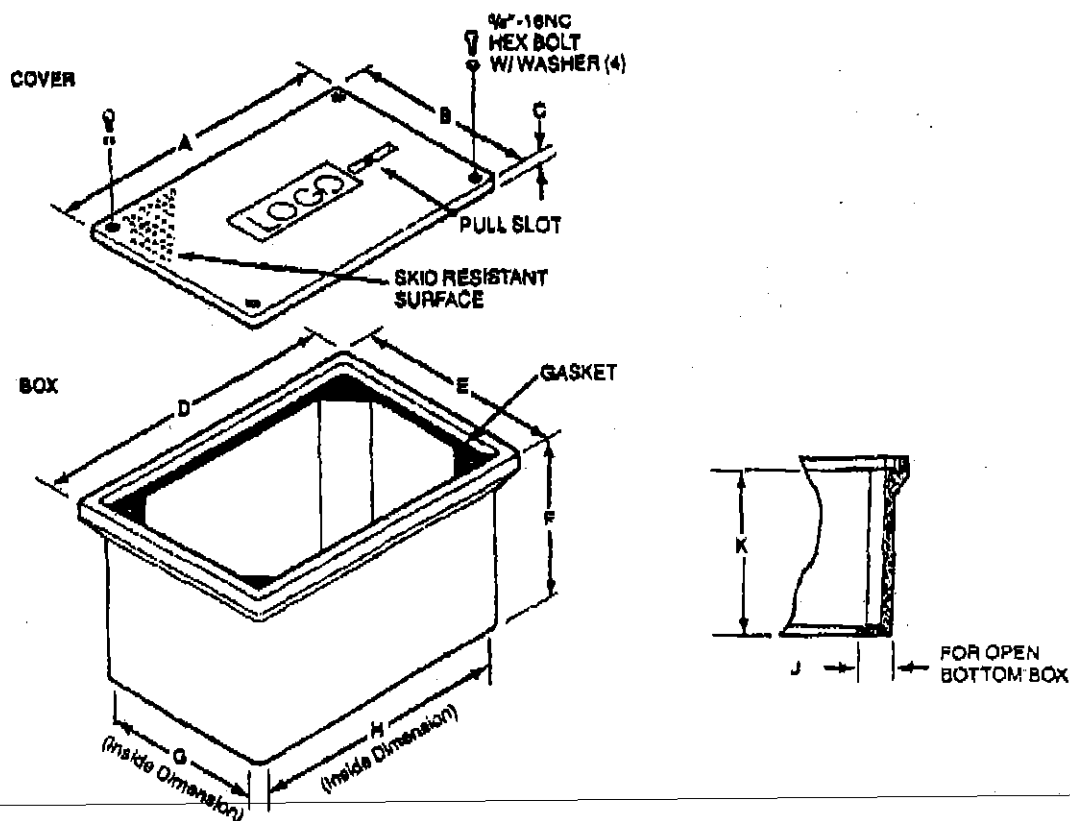
Date: *9-28-95*

From: *Joe Martell*

No. of pages in transmittal *6*

Comments: *cut sheets for Canton Drop Forge.*

CDF005938

SPECIFICATIONS/DATA**12" x 12", 8" x 18" & 11" x 18" PC Style Gasketed Boxes****Options**

1. Stainless steel Penta-head bolt
2. Specific cover logo
3. Green or other colors
4. Special holes

Covers (Blank unless logo is specified)

DESCRIPTION	PART NO.	DIMENSIONS (IN.)			WT. LBS.
		A	B	C	
Standard Cover 4 bolts	PC0818CG00	8	18	1 1/2	11
	PC1118CG00	11	18	1 1/2	18
	PC1212CG00	12	12	1 1/2	8
Heavy Duty Steel Locking Cover	PC0818SG00	8	18	1 1/2	25
	PC1118SG00	11	18	1 1/2	40
	PC1212SG00	12	12	1 1/2	25

Boxes (Gasketed)

DESCRIPTION	PART NO.	DIMENSIONS (IN.)							WT. LBS.
		D	E	F	G	H	J	K	
Box W/Solid Base	PC0818QG08	8	18	12	12	12	12	12	29
	PC1118QG12	11	18	12	12	12	12	12	49
	PC1212QG12	12	12	12	12	12	12	12	32
Box W/Open Base	PC0818BG08	8	18	12	12	12	12	12	20
	PC1118BG12	11	18	12	12	12	12	12	42
	PC1212BG12	12	12	12	12	12	12	12	27

Suggested Specifications

Underground enclosures shall be Compositite® as manufactured by Quazite® Corporation or approved equal. Enclosures and covers shall be concrete gray color and rated for no less than 8,000 lbs. over a 10" x 10" area and be designed and tested to temperatures of -50°F. Material compressive strength should be no less than 11,000 psi. Covers shall have a minimum coefficient of friction of .5. Boxes shall be stackable for extra depth.

Quazite®
COMPOSITITE

A Division of **JAMIC**

304 Industrial Blvd. • Lenoir City, Tennessee 37771
800/345-3062 • 615/988-9725 (In TN)

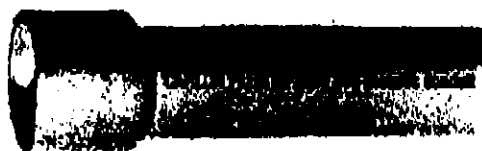
RIGID NONMETALLIC CONDUIT

Specifications and Data

CARLON PLUS 40® RIGID PVC NONMETALLIC CONDUIT (Heavy Wall EPC)

For underground applications encased in concrete or direct burial. Also for use in exposed or concealed applications aboveground.

- UL Listed
- Sunlight resistant
- Rated for use with 90°C conductors
- Superior weathering characteristics



CARLON PLUS 80® RIGID PVC NONMETALLIC CONDUIT (Extra Heavy Wall EPC-80)

For use in aboveground and belowground applications that are subject to physical damage.

- UL Listed
- Sunlight resistant
- Rated for use with 90°C conductors
- Superior weathering characteristics



PLUS 40® Heavy Wall

Nom. Size	Part No.	OD	ID	Wall	Wt. Per 100' (Lbs.)	Feet Per 100' (Lbs.)
1/2"	49005	.840	.622	.109	18	100
3/4"	49007	1.050	.824	.113	23	100
1"	49008	1.315	1.049	.133	35	100
1 1/4"	49009	1.660	1.380	.140	48	50
1 1/2"	49010	1.800	1.610	.145	57	50
2"	49011	2.375	2.067	.154	76	50
2 1/2"	49012	2.875	2.488	.203	125	10
3"	49013	3.500	3.066	.216	184	10
3 1/2"	49014	4.000	3.548	.228	198	10
4"	49015	4.500	4.028	.237	234	10
5"	49016	5.563	5.047	.258	317	10
6"	49017	6.625	6.065	.280	412	10

Rigid nonmetallic conduit is normally supplied in standard 10' lengths, with one belled end per length. For specific requirements, it may be produced in lengths shorter or longer than 10', with or without belled ends.

PLUS 80® Extra Heavy Wall

Nom. Size	Part No.	OD	ID	Wall	Wt. Per 100' (Lbs.)	Feet Per 100' (Lbs.)
1/2"	49405	.840	.546	.147	21	100
3/4"	49407	1.050	.742	.154	28	100
1"	49408	1.315	.957	.179	43	100
1 1/4"	49409	1.660	1.278	.191	50	50
1 1/2"	49410	1.800	1.500	.200	72	50
2"	49411	2.375	1.939	.218	100	10
2 1/2"	49412	2.875	2.323	.276	159	10
3"	49413	3.500	2.900	.300	212	10
4"	49415	4.500	3.828	.337	310	10
5"	49416	5.563	4.813	.376	431	10
6"	49417	6.625	5.193	.432	592	10

Rigid nonmetallic conduit is normally supplied in standard 10' lengths, with one belled end per length. For specific requirements, it may be produced in lengths shorter or longer than 10', with or without belled ends.

FOR FASTER SERVICE ORDER TYPE 40 IN UNITIZED QUANTITIES

NOMINAL SIZE	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"
10'	Unit Quantity	6000'	4400'	3600'	3300'	1800'	1400'	940'	880'	630'	570'	380'
1/2 Unit Quantity*		3000'	2200'	1800'	1650'	900'	700'	470'	—	—	—	—
20'	Unit Quantity	12,000'	8800'	7200'	6600'	3600'	3520'	1880'	1760'	1260'	1140'	760'

Use Schedule 40 Fittings with PLUS 40® A, and 80 and P&C® Duct Fittings with P&C® Type EB Duct.

- Notes:
1. When ordering Carlon PLUS 40® and fittings specify size and order by part number to assure correct shipment.
 2. Special fittings and conduit sizes will be quoted on request.
 3. DON'T FORGET TO ORDER CEMENT.
 4. Carlon reserves the right to ship to the nearest unitized quantity.

*PLUS 40® only.

HAMMONTREE & ASSOCIATES, LIMITED

Engineers • Planners • Surveyors
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

Canton 216/499-8817
Akron 216/633-7274

FAX 216/499-0149
Toll Free 1-800-394-8817

LETTER OF TRANSMITTAL

1(c)(d)(e)

DATE

12/15/95

ATTENTION

KEITH HOUSEKNECHT

RE

WORKMAN INVOICES #
3820 AND 3822

TO KEITH HOUSEKNECHT
CANTON DROP FORG

WE ARE SENDING ☐ ATTACHED ☐ UNDER SEPARATE COVER VIA _____:

☐ SAMPLES☐ SHOP DRAWINGS☐ CONTRACTS☐ LITERATURE☐ ENGINEERING DRAWINGS☐ OTHER _____☐ PLANS☐ CHANGE ORDERS☐ PRINTS☐ LETTERS

COPIES	DATE	NO	DESCRIPTION
1	12/15		INVOICES 3820 & 3822 FROM WORKMAN

THESE ARE BEING SENT:☒ FOR YOUR APPROVAL☐ FOR YOUR USE☒ FOR YOUR REVIEW☐ FOR YOUR COMMENTS☐ FOR YOUR SIGNATURE☐ FOR YOUR _____☐ APPROVED AS NOTED☐ APPROVED AS SUBMITTED☐ APPROVED AS CHANGED☐ REJECTED AS NOTED☐ REJECTED AS CHANGED☐ RETURNED FOR CORRECTIONS☐ RESUBMIT _____ COPIES FOR APPROVAL☐ SUBMIT _____ COPIES FOR DISTRIBUTION☐ RENEW _____ COPIES FOR

NOTES

These need to be reviewed and approved by CDF
and then sent to Black, McCuskey, Savers & Arbough
for processing. Please check the funds available from
the escrow account

COPY TO

SIGNATURE

Lena J. Hill

TITLE

DATE

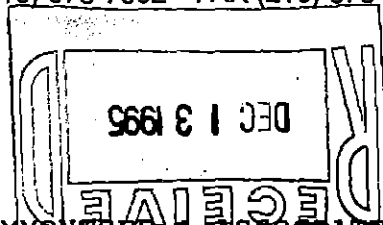
12/15/95

CDF005941



**Workman
Industrial
Services, Inc.**

320 Tallmadge Road • Kent, Ohio 44240
Phone (216) 678-7002 • FAX (216) 678-7322



HAMMONTREE & ASSOCIATES, LTD
5233 STONEHAM ROAD
NORTH CANTON, OH 44720

ATTN: ACCOUNTS PAYABLE

INVOICE

INVOICE #: 3822 PG 1
INVOICE DATE: 12/05/95
OUR JOB NO: 454

JOB: CANTON DROP FORGE
PHASE ONE

Quantity	Unit Description	Unit Price	Ext Price
	12/05/95 PROGRESS BILLING TWO CANTON DROP FORGE PHASE I		
	ITEM 4.1 1.20 GPM OIL/WATER SEPARATION YARD SYSTEM - PARTIAL BILLING MATERIALS AND LABOR		7,860.00
	ITEM 4.2B DESIGN SERVICES		7,088.00

Engineer's Certification: I certify that this work was for the design and construction of the Industrial Pretreatment program to replace Lagoon # 1 and # 2 as recommended by the Phase II Audit and to treat processed water upon the closures of Lagoons # 1 and 2. The changes are necessary steps for the installation of a new water pretreatment system.

Gene G. Hill
Gene G. Hill, EIT, M.S.

12/14/95

CDF005942

TERMS: NET 30

SUBTOTAL CHARGE 14,948.00

LESS RETAINAGE WITHHELD 1,345.32

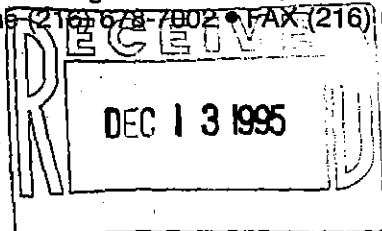
LESS PREVIOUS PAYMENTS

TOTAL AMOUNT DUE THIS INVOICE 13,602.68

CLT #: 153



320 Tallmadge Road • Kent, Ohio 44240
Phone (216) 678-7802 • FAX (216) 678-7322



HAMMONTREE & ASSOCIATES, LTD
5233 STONEHAM ROAD
NORTH CANTON, OH 44720

INVOICE

*** REPRINT ***

INVOICE #: 3820 PG 1
INVOICE DATE: 12/01/95
OUR JOB NO: 454

PER CHANGE ORDER #003

Quantity	Unit	Description	Unit Price	Ext. Price
11/09/95 JACKHAMMER FOR CASTING. SET GRADE RINGS AND CASTING. INSTALL GAURD POST.				
3.	HOUR	SUPERVISOR	31.0000	93.00
3.	HOUR	GENERAL LABOR	27.0000	81.00
2.	HOUR	TRUCK	9.5000	19.00
1.	HOUR	AIR COMPRESSOR	9.0000	9.00
1.	HOUR	SAW	8.5000	8.50
		MATERIAL 6" PIPE		95.00
11/13/95 POUR CONCRETE, COVER WITH BLANKETS. FILL GUARD POST POLES.				
4.	HOUR	SUPERVISOR	31.0000	124.00
8.	HOUR	GENERAL LABOR	27.0000	216.00
		MATERIAL TREATY		182.05
		MATERIAL TREATY		75.33
		MATERIAL ORVILLE TRUCKING		64.63

Engineer's Certification: I certify that this work was for the design and construction of the Industrial Pretreatment program to replace Lagoon # 1 and # 2 as recommended by the Phase II Audit and to treat processed water upon the closure of Lagoons # 1 and 2. The changes are necessary steps for the installation of a new water pretreatment system.

CDF005943

SUBTOTAL CHARGE 967.51

LESS RETAINAGE WITHHELD
LESS PREVIOUS PAYMENTS

TOTAL AMOUNT DUE THIS INVOICE 967.51

CLT #: 153

THIS IS NOV 3 1995
RAISING THE TOP OF EXISTING
BRICKMANHOLE, ESTIMATED
AT \$970.00.

KSH
12/12/95

G. G. Hill
G. G. Hill, EIT, M.S.

12/14/95

CANTON DROP FORGE
Stark County, Ohio
Proposal for
INDUSTRIAL PRETREATMENT SYSTEM
Contract 95-1

- NOTE 1: THE SIGNING OF THE BID REPRESENTS THE BIDDER'S ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE INSTRUCTIONS TO BIDDERS AND THE SPECIFICATIONS AND PROVISIONS AND THAT THE BIDDER WILL ENTER INTO THE CONTRACT IF HE IS AWARDED THE BID AND WILL ENTER SAID CONTRACT WITHIN TEN (10) DAYS OF NOTICE OF AWARD. BID IS TO BE FIRM AND MAY NOT BE WITHDRAWN FOR A PERIOD OF SIXTY (60) CALENDAR DAYS.
- NOTE 2: THE BIDDER AGREES THAT CANTON DROP FORGE HAS THE RIGHT TO REJECT ANY OR ALL BIDS AND TO WAIVE INFORMALITY IN ANY BID AND THAT THE BIDDER SHALL NOT DISPUTE THE CORRECTNESS OF THE METHODS USED IN COMPUTING THE LOWEST RESPONSIBLE BIDDER.
- NOTE 3: ALL COSTS OF MAINTENANCE WORK DURING CONSTRUCTION AND BEFORE THE FINAL ACCEPTANCE IS MADE SHALL BE INCLUDED IN THE LUMP SUM PRICES BID ON THE VARIOUS BID ITEMS AND THE CONTRACTOR WILL NOT BE PAID AN ADDITIONAL AMOUNT FOR SUCH WORK.

TO: CANTON DROP FORGE
4575 SOUTHWAY STREET S.W.
P.O. BOX 44706
CANTON, OHIO 44706

FROM: WORKMAN INDUSTRIAL SERVICES INC
FIRM NAME

330 TALLMADGE RD

KENT OH 44240
ADDRESS

TELEPHONE NO. (216) 678-7002

**Canton Drop Forge
Industrial Pretreatment System**

April 1995

Item No	Item	Est'd Quantity	Unit	Separate Unit Prices (figures)		Combined Unit Prices (to be written in words)	Quantity Times Unit Total
				Mat'L	Labor	Mat'l-Labor-Unit-Total	Amount
4.1	120 gpm oil/water separation yard system - complete	Lump Sum	1	75080	27449	ONE HUNDRED TWO THOUSAND FIVE HUNDRED TWENTY NINE	102529
4.2a	98% efficient horizontal cyclone oil/steam separator - 120,000 lbs/hr - complete	Lump Sum	1	32049	13355	FORTY FIVE THOUSAND FOUR HUNDRED AND FOUR	45404
4.2b	Condensate oil/water separator w/boiler house sump pump revisions - complete	Lump Sum	1	47724	16522	SIXTY FOUR THOUSAND TWO HUNDRED FORTY SIX	64246
	Design Services	Lump Sum			47922	FORTY SEVEN THOUSAND NINE HUNDRED TWENTY TWO	47922
						TWO HUNDRED SIXTY THOUSAND ONE HUNDRED ONE	260101

TOTAL AMOUNT OF BID

Two hundred sixty thousand one hundred & one (\$ 260101)
(Written Out)

The Contractor agrees to complete all of the work specified here in within one hundred eighty (180) calendar days after the date of Notice to Proceed. The contractor further agrees to pay as liquidated damages, the sum of \$500.00 for each consecutive calendar day thereafter as provided in the information and Instructions to Bidders. The bid prices shall include all labor, materials, equipment, overhead, profit, insurance, etc., to cover the finished work.

Bidder understands that Canton Drop Forge (CDF) reserves the right to reject any or all bids and waive any informalities in the bidding. The bidder agrees that this bid shall be good any may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of Notice of Award by CDF, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required. The bid security attached in the form of BID GUARANTY in the sum of TWO HUNDRED SIXTY THOUSAND ONE HUNDRED & ONE (\$ 260101) is to become the property of CDF in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to CDF caused thereby.

BIDDER acknowledges receipt of the following ADDENDUM:

Addendum No. 1, Dated APRIL 27 1995
Addendum No. _____, Dated _____
Addendum No. _____, Dated _____
Addendum No. _____, Dated _____

CANTON DROP FORGE
Stark County, Ohio
Proposal for
INDUSTRIAL PRETREATMENT SYSTEM
Contract No. 95-1

CANTON DROP FORGE RESERVES THE RIGHT TO ACCEPT OR REJECT ANY AND ALL BIDS.
THE BID WILL BE AWARDED TO THE LOWEST RESPONSIBLE BIDDER.

BID IS FIRM FOR SIXTY (60) DAYS.

ATTACHMENTS: BID GUARANTY BOND OR CONSENT OF SURETY FORM.
NON-COLLUSION AFFIDAVIT

SIGNATURE CLAUSE:

IF A CORPORATION

WORKMAN INDUSTRIAL SERVICES INC

NAME OF CORPORATION

SIGNATURE: [Signature]

PRESIDENT

SIGNATURE: [Signature]

SECRETARY

IF A PARTNERSHIP:
(List All Partners)

NAME OF PARTNERSHIP

SIGNATURE: _____

SIGNATURE: _____

SIGNATURE: _____

IF AN INDIVIDUAL DOING BUSINESS
UNDER THE FIRM NAME AND STYLE OF: _____

STATE OF OHIO

COUNTY OF PORTAGE

SIGNATURE: _____

SWORN TO AND SUBSCRIBED BEFORE ME THIS 15th DAY OF MAY, 1995.

Phyllis J. Prinzo, Notary Public
Residence - Summit County
State Wide Jurisdiction, Ohio
My Commission Expires Oct. 31, 1997

[Signature]
NOTARY PUBLIC

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

The signatory of this proposal guarantees the truth and accuracy of all statements and of all answers to interrogatories hereinafter made.

1. How many years have you been in business as a General Contractor under you present business name? 23 years
2. How many years have you been in principal officer of a general contracting firm under another name? 0
3. What projects of a similar nature has your organization completed?

(Note: Fill out each blank completely)

Name of Owner and Location	Name and Address of Person in Responsible Charge as Reference	Class of Work	Amount of Contract	Date of Completion
CUYAHOGA STEEL & WIRE SOLON, OH	BILL COOK 31000 SOLON RD SOLON, OH 44139	INDUSTRIAL WASTE PRETREAT- MENT SYSTEM	\$150,000	11/93
NORTH COAST ENVIRONMENTAL CLEVELAND, OH	GARY ENGLER 3200 WEST 65TH ST CLEVELAND, OH 44102	INDUSTRIAL WASTE PRETREAT- MENT SYSTEMS	MULTIPLE	ONGOING
ALLEN AIRCRAFT PRODUCTS RAVENNA, OH	CHARLES ADAMS 4879 NEWTON FALLS RD RAVENNA, OH 44266	POLLUTION CONTROL BUILDING	\$90,000	1985
CHRYSLER STAMPING PLANT TWINSBURG, OH	Subcontractor to: SCHIRMER CONSTRUCTION 4197 W. 150TH ST CLEVELAND, OH	LINED WASTEWATER RETENTION BASIN & OIL SKIMMER	\$62,000	1984
BUCKEYE PIPELINE COMPANY MANTUA, OH	Subcontractor to: Ruhlin Construction 6867 RIDGE RD SHARON CENTER, OH	GROUNDWATER COLLECTION SYSTEM WITH OIL SKIMMER	\$49,000	1983

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

Have you, or your Company, or any organization of which you have been a responsible officer or agent, ever failed to complete any work awarded to you? If so, where and why?

No

The work awarded or to be awarded will have the personal supervision of whom?

ROBERT H. SCHAEFER - WORKMAN INDUSTRIAL SERVICES, INC.

GARY E. ENGLER, P.E. - NORTH COAST ENVIRONMENTAL, INC.

Explain approximately your plan and layout for performing the proposed work.

SEE attached



320 Tallmadge Road • Kent, Ohio 44240 • (216) 678-7002 • Fax (216) 678-7332

APPROXIMATE PLAN FOR PROPOSED WORK

Excavate locations for interception points on 120 GPM separator, record elevations, begin design of separator location and elevation. Order equipment upon approval of design.

Obtain discharge elevations of 50 GPM separator and collection box, clear preliminary designs with consulting engineer and plant personnel as to location of cyclones and separator, piping routes, modify as needed, order equipment.

Based upon delivery of equipment, begin installation of collection and discharge piping. Coordinate installation of piping tie-ins and electrical work with plant operations to minimize interference. Provide as built documents, equipment manuals and start up of system.

EXPERIENCE AND EQUIPMENT QUESTIONNAIRE

7. What equipment do you own that is available for the proposed work?

Quantity	Description Size, Capacity, Etc.	Condition	Years of Service
see attached			

8. At what places are the principal items of the equipment located?

320 TALLMADGE RD KENT, OH



320 Tallmadge Road • Kent, Ohio 44240 • (216) 678-7002 • Fax (216) 678-7332

EQUIPMENT SUMMARY

Air Compressors
Bore Machine
Cement Mixer
Concrete Bucket
Concrete Vibrator
Cranes
 18 Ton
 30 Ton
Dozers
 60 H.P.
 125 H.P.
 250 H.P.
Drills
Excavators
 Ford Backhoes
 3/4 C.Y. Koehring
 1 1/4 C.Y. Koehring
Grinders
Hammers
 Demolition Hammer
 Excavator & Compressor Combination
 Jack Hammer
 Rotary Hammer
Lasers
Loaders
 1.5 C.Y Rubber Tired
 2.0 C.Y. Track
Pipe Threading Equipment
Power Buggies
Pressure Washer
Pumps
Saws
 Chain Saw
 Concrete Saw w/Regular Blade
 Concrete Saw w/Diamond Blade
 Electric Saw
Small Tractor w/Tools
Tampers
Trailers
Trucks
 Carry All
 Dump Truck Single Axle
 Dump Truck Tandem Axle
 Fork Truck
 Utility Truck
 Pick Up Truck
Welders

BID GUARANTY FORM 1
BID GUARANTY BOND

(Not to be filled out if a certified check is submitted)

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned WORKMAN INDUSTRIAL SERVICES, INC., 320 TALLMADGE RD., KENT, OH 4424

(Name and Address of Contractor)

as Principal, hereinafter called Principal, and PEERLESS INSURANCE COMPANY,

P. O. BOX 545, DUBLIN, OHIO 43017-0545

(Name and Full Mailing Address of Surety)

as Surety, hereinafter called Surety, are hereby held and firmly bound unto Canton Drop Forge, as Oblige in the penal sum of the dollar amount of the bid submitted by the Principal to the Oblige on the 15TH day of MAY, 1995, to undertake the project known as the INDUSTRIAL PRETREATMENT SYSTEM. The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Oblige, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Oblige, which are accepted by the Oblige. In no case shall the penal sum exceed the amount of one hundred (100) percent of the bid including any alternates which may be accepted. For the payment of the penal sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal has submitted a bid for the project.

NOW, THEREFORE, if the Oblige accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the event the Principal pays to the Oblige the difference not to exceed ten (10) percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Oblige may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Oblige does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal pays to the Oblige the difference not to exceed ten (10) percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmission, of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if the Oblige accepts the bid of the Principal and the Principal within fifteen days after the awarding of the contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of material, which said contract is made a part of this bond the same as though set forth herein:

NOW ALSO, if the said Principal shall well and faithfully do and perform the things agreed by the Principal to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Oblige herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

Page 2

Signed this 9TH day of MAY 1995

Cheryl S. Eldredge
Witness of Principal

By James T. West

Title: PRESIDENT

Mary Kay Gerriets
Witness of Attorney-in-Fact

~~SURETY. PEERLESS INSURANCE COMPANY~~

By James D. DeLong
Attorney-in-Fact

P. O. BOX 545

DUBLIN, OHIO 43017-0545

(Full Mailing Address)

(Facsimile signatures are not acceptable)

(This Bond may be photocopied but not retyped)

№ 939028

62 MAPLE AVENUE KEENE NEW HAMPSHIRE 03431

This power of attorney is invalid for any instrument dated after December 1, 1996

William W. Godfrey and/or Peter G. DeAngelis and/or Mary Kay Gerrets

in the State of **Ohio**

their/its true

bonds, undertakings, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, unlimited as to Dollar Amount:

I, the undersigned, the Company's Chief Executive Officer, hereby certify that the foregoing information has been reviewed and is true and correct, and that the undersigned is duly authorized to execute this certificate on behalf of the Company.

AUTHORITY FOR MAKING APPOINTMENT OF ATTORNEYS-IN-FACT

Appointment of Attorneys-in-Fact by the Peerless Insurance Company are made pursuant to the following Bylaw adopted by the Stockholders of the Company on November 12, 1982, as amended February 9, 1984, and further amended April 28, 1988, to wit:

SECTION 7 of ARTICLE 42 The President may appoint or remove Attorneys-in-Fact, Resident Vice Presidents, Resident Assistant Vice Presidents and Resident Assistant Secretaries and assign to them and revoke at appropriate such duties, powers and authority as may be advantageous to the Company including the execution and authentication of bonds, underwrites, recognizances, contracts of indemnity and all other writings obligatory in the nature thereof and other documents on behalf of the Company with power to redeliver such authority.

Appointment of Attorneys-In-Law: The Notetakers' Board of Directors has made the following Resolution adopted by the stockholders of the Company on May 7, 1979, as amended February 1, 1984, and further amended January 10, 1986.

[illegible]

PROFESSIONALISM

The officers and directors of the Company are subject to the following restrictions on the sale of the Company's securities:

"RESOLVED that the signature of any Officer as well as the seal of the Company may be affixed to the assignment of any duty, power or authority or the revocation thereof or the certification thereof by facsimile and that any such assignment or revocation bearing the facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any document to which it is attached.

Use of facsimile signatures by The Netherlands Insurance Company is made pursuant to the following Resolution adopted by the Board of Directors of the Company at its meeting held on the 28th day of April, 1988:

RESOLVED that the signature of any Officer, as well as the seal of the Company may be affixed to the assignment of any duty or authority or the revocation thereof or the certification thereof by facsimile and that any such assignment or revocation bearing the facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any assignment to which it is attached.

COMPANY MAKING APPOINTMENT

The company making this appointment is identified by an "X" in the box opposite its name in the space provided below and in the "To Whom It May Concern" space on the back of this document.

PETROLEUM INSURANCE COMPANY

THE NETHERLANDS INSURANCE COMPANY

65-000 2/1

SINGLE OR DUAL POWER OF ATTORNEY

It is the intent of the Peerless Insurance Company and The Netherlands Insurance Company to use this instrument for the appointment of Attorney(s)-in-Fact for either Company designated, or for both Companies, if so indicated.

In Witness Whereof

PEERLESS INSURANCE COMPANY

THE NETHERLANDS INSURANCE COMPANY

has/have caused these

presents to be signed by its President, and its Corporate Seal to be hereto affixed by its Secretary, this 4th day of November 19 94

PEERLESS INSURANCE COMPANY

THE NETHERLANDS INSURANCE COMPANY

By:

Richard T. Ball
President

By:

[Signature]
President

Attest:

Joseph P. Tracey
Secretary

Attest:

Joseph P. Tracey
Secretary

STATE OF NEW HAMPSHIRE

COUNTY OF CHESHIRE

SS.

On this 4th day of November, 1994, before the subscriber, a Notary Public of the State of New Hampshire in and for the County of Cheshire duly commissioned and qualified came Richard T. Ball, President of the Peerless Insurance Company and Roger L. Jean, President of The Netherlands Insurance Company and Joseph P. Tracey, Secretary of the Peerless Insurance Company and of The Netherlands Insurance Company, to me being personally known to be the individuals and officers described herein and who executed the preceding instrument and they acknowledged the execution of same, and being by me duly sworn, deposed and said that they are officers of said Company(ies) aforesaid and that the seal(s) affixed to the preceding instrument is/are the Corporate Seal(s) of said Company(ies) and the said Corporate Seal(s) and their signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of the said Company(ies), and that Section 7 of Article 10 of the Bylaws of the Peerless Insurance Company adopted on November 12, 1987, and the Resolution of The Netherlands Insurance Company adopted May 1, 1990, are the preceding instrument.

In Testimony Whereof, I have hereunto set my hand and affixed my Official Seal at Keene, New Hampshire.

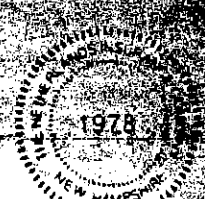
Rhonda E. Jordine Notary Public



I, Joseph P. Tracey, Secretary of the Peerless Insurance Company and The Netherlands Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of Power of Attorney executed by the Company(ies) designated above which is still in force and effect.

In Witness whereof, I have hereunto set my hand and affixed the Seal(s) of the Company(ies) at Keene, New Hampshire, this 7th Day of May 19 95

Joseph P. Tracey
Joseph P. Tracey
Secretary



CDF005956

NON-COLLUSION AFFIDAVIT

This affidavit is to be filled out and executed by the bidder. If the bid is made by a corporation, then by its properly authorized agent.

The name of the individual swearing to the affidavit should always appear on the line marked "Name of Affiant". The affiant should sign his/her name at end, not a partnership nor corporation name, and swear to said affidavit before a Notary Public, who must attach his seal.

STATE OF OHIO, COUNTY OF PORTAGE, SS.

INDUSTRIAL PRETREATMENT SYSTEM, CANTON DROP FORGE

JAMES T. WORKMAN being duly sworn, deposes and says that he is
(Name of Affiant)

PRESIDENT of
(sole owner, partner, president, secretary, etc.)

WORKMAN INDUSTRIAL SERVICES, INC. residing

320 TALLMADGE RD, KENT, OH 44240 and that

WORKMAN INDUSTRIAL SERVICES, INC.
(person, firms, corporations interested in the bid)

is or are the only persons interested in the profits of any contract which may result from herein contained proposal; that the said proposal is made without any connection or interests in the profit thereof with any other person making any other bid or proposal for said work; that the said proposal is in all respects fair, and without collusion or fraud; and also that no member of Canton Drop Forge, head of any department or bureau of employee therein, or any officer of Canton Drop Forge, is directly or indirectly interested therein; and that all the statements made by him in this proposal are true.

Signed: [Signature] Title: PRESIDENT
Affiant

Subscribed and sworn before me this 15th day of MAY 19 95.

Phyllis J. Prinzo Notary Public

Phyllis J. Prinzo, Notary Public
Residence - Summit County
Statewide Jurisdiction, Ohio
My Commission Expires Oct. 31, 1999

1 (c)(d)(e)

RECEIVED

JUN 5 1995

CANTON DROP FORGE

QUESTIONNAIRE FOR BIDDERS
CANTON DROP FORGE PROJECT #95-1
INDUSTRIAL PRETREATMENT

June 1, 1995

Prepared by:

Hammontree & Associates, Limited
5233 Stoneham Road
North Canton, Ohio 44720

Prepared for:

Canton Drop Forge
4575 Southway Street
P. O. Box 6902
Canton, Ohio 44706-0902

CDF005958

**QUESTIONNAIRE FOR BIDDERS
CANTON DROP FORGE PROJECT #95-1
INDUSTRIAL PRETREATMENT**

ITEM 4.1: 120 gpm oil/water separation yard system complete.

A. What is the proposed brand and model?

B. What capacity does it have?

C. What is the operating principle?

D. Is the unit mechanical, chemical electrical, both, etc.?

E. Is the Unit aboveground or below ground? Is secondary containment provided? A vault? A UST?

F. What is the required O&M? Cost of frequently replaced parts or media? Servicing requirements?

G. Does the manufacturer supply performance and mechanical guarantees or warranties? How long?

H. Has the manufacturer received samples and verified performance capabilities?

I. Will the unit be able to achieve the 10 mg/l requirement? Can the unit handle emulsified oils?

J. If the 10 mg/l requirement can not be achieved, what treatment level can be achieved?

K. Is there a substantial cost savings to Canton Drop Forge by using a higher effluent limit from this unit?

L. What flexibility does the proposed unit have (expandability, waste-stream, spills, composition)?

M. Miscellaneous comments.

**QUESTIONNAIRE FOR BIDDERS
CANTON DROP FORGE PROJECT #95-1
INDUSTRIAL PRETREATMENT**

ITEM 4.2: 98% efficient horizontal cyclone oil/steam separator - 120,000 lb./hr. complete.

A. What is the proposed brand and model?

B. What capacity does it have?

C. What is the operating principle? Can it handle emulsified oils?

D. Is the unit mechanical, chemical electrical, both, etc.?

E. Is the Unit aboveground or below ground?

F. What is the required O&M? Cost of frequently replaced parts or media?
Servicing requirements?

G. Does the manufacturer supply performance and mechanical guarantees or warranties? How long?

H. Has the manufacturer received samples and verified performance capabilities?

I. Will the unit be able to achieve the 10 mg/l requirement?

J. If the 10 mg/l requirement can not be achieved, what treatment level can be achieved?

K. Is there a substantial cost savings to Canton Drop Forge by using a higher effluent limit from this unit?

L. What flexibility does the proposed unit have (expandability, waste-stream, spills, temperature, pH, composition)?

M. Miscellaneous comments.

**QUESTIONNAIRE FOR BIDDERS
CANTON DROP FORGE PROJECT #95-1
INDUSTRIAL PRETREATMENT**

**ITEM 4.2b: Condensate oil/water separator w/boiler house sump pump
revisions - complete.**

A. What is the proposed brand and model?

B. What capacity does it have?

C. What is the operating principle?

D. Is the unit mechanical, chemical electrical, both, etc.?

E. Is the Unit aboveground or below ground? Is secondary containment provided? A vault? A UST?

F. What is the required O&M? Cost of frequently replaced parts or media? Servicing requirements?

G. Does the manufacturer supply performance and mechanical guarantees or warranties? How long?

H. Has the manufacturer received samples and verified performance capabilities?

I. Will the unit be able to achieve the 10 mg/l requirement? Can the unit handle emulsified oils?

J. If the 10 mg/l requirement can not be achieved, what treatment level can be achieved?

K. Is there a substantial cost savings to Canton Drop Forge by using a higher effluent limit from this unit?

L. What flexibility does the proposed unit have (expandability, waste-stream, spills, temperature, pH, composition)?

M. Miscellaneous comments.

R. JAMES HAMMONTREE, P.E., P.S.
BRUCE M. BAIR, P.E., P.S.
LAWRENCE D. PHILLIPS, P.E., P.S.
CHARLES F. HAMMONTREE, P.E., P.S.
RONALD P. DOHY, P.S.
GARY L. TOUSSANT, P.S.
JOSE E. TOLEDO, P.E., P.S.
RICHARD R. COOK, P.E., P.S.
JAMES C. BOLLIBON, P.E., P.S.
KEITH A. BENNETT, P.E., P.S.
BARBARA H. BENNETT, P.E., P.S.

HAMMONTREE & ASSOCIATES, LIMITED
Consulting Engineers - Planners - Surveyors

TREEMORE BUILDING
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

PHONE (216) 499-8817
FAX (216) 499-0149
TOLL FREE 1-800-394-8817

167(d)(c)
MICHAEL L. DECKER, P.S.
RICHARD J. FAULHABER, P.E., P.S.
GREGORY E. MENCER, A.P.A.
DANIEL J. GRINSTEAD, P.E.
MARK E. FRANZEN, P.E.
KARL J. OPRISCH, P.E.
JEFFREY L. SPRAY, P.S.
PAUL A. TOMIC, P.S.
WILLIAM N. CLARK, P.E., P.S.
THOMAS J. KING, P.S.
DOMINIC A. MARTUCCIO, P.E., P.S.
PAUL A. MILLER, P.S.

April 27, 1995

HAMMONTREE & ASSOCIATES, LIMITED

**Addenda #1
Canton Drop Forge
Contracts 95-1 Only**

RECEIVED

MAY 1 1995

CANTON DROP FORGE

1. Bid Date: May 15, 1995
2. Item 4.2a - 98% efficient horizontal cyclone. Should include consideration of a mist eliminator as described 4.2.2 and 4.2.3 to obtain 98% results going out the stack.

CDF - Prebid Meeting
SIGN IN

4/21/95

Name	Co & Address	Phone
① LARRY Phillips	Hammontree & Associates, 5235 Storcha Rd N Canton OH 44720	206/499-9001
② KEITH Housenick	CANTON DROP FORGE 4575 Southview Canton OH	216 477 45
③ RANDY FARNETH #95-2	KEZLINER ENVIRONMENTAL 2605 WILLIAMSBURG LN CANTON, OH. 44708	478-9090
④ JEANNETTE WIERZBICKI #95-1	FBA Environmental 107 N Main St Suite 200 Mason, Ohio 43302	(614) 383-2182
⑤ BOB HOLDINGS #95-1	BOWEN ENG. 3128 EAST 17TH STREET Columbus OH 43219	
⑥ Scott Klingensmith #95-2	Environmental Resources, Inc. P.O. Box 276 Westerville, Ohio 43086	614-431-819
⑦ SAM SCHAEFER #95-1	WORKMAN IND. SERVICES 320 TALLMADGE RD KENT OHIO 44240	Jim
⑧ GRANT MARGRETT #95-1	NORTH COAST ENVIRONMENTAL 3200 W. 65TH CLEVELAND, OHIO 44102	

1(c)(d)(e)
2(b)

Pre-Bid Meeting
Canton Drop Forge

4/21/95
LDP
1 of 2

① Sign-In

② Contract 95-1 Industrial Preheatnat
95-2 Bioremediation Lagoons #1 & #2

③ Contracts 1 & 2

- a) Bids are due May 1st 12 Noon
- b) When they will be opened & read
- c) Is this a hard ship for anyone
- d) Bid Security in the amount of 10%
- e) 100% performance Bond
- f) One year maintenance Bond
- g) Standard insurance will be required
- h) Working Hours will be flexible to minimize CDF shutdown or business disruption
- i) Bid form must be filled out & signed 2 copies
- j) Experience must be filled out

④ Contract 1

- a) Description of work described on page 3
- b) Design/Build Concept
- c) Design team is required to provide E/OIRs 4/1/1
- d) Estimated Construction Cost \$200,000
- e) discharge Limits should not exceed 10 ppm
- f) Construction time is 180 days \$500/day liquidated damages
- g) There are to be no discussions with OEPA or other agencies without written approval from CDF
- h) Refer to Preliminary Engineering Report

CDF005976

⑤ Contract 2

- a) 3000 CY \pm sludge in Lagoon 1 Estimate
- b) 6000 CY \pm Sludge in Lagoon 2 "
- c) Prepare 2 Cells on CDF site

CDF

2 of 2

- e) Bioremediation to accomplish 380 ppm TPH or below
- f) Contractor is to include Bulk materials
- g) 730 days to complete
- h) Estimated cost is \$200,000
- i) Contract will require completion of work to obtain 380 ppm in 540 days
If this is not obtained the remaining 6 mos will be used to possibly remove & dispose of the sludge at the Contractor's expense. No additional compensation will be paid. pg 15
- j) Award will be made on Total \$ for remediation of Both lagoons

⑥ Questions

⑦ Site Visits

CDF will remove liquid from lagoon #1 & #2

① Soil logs to FBA

② Pump from yard to CB going to lagoon #2
Emergency discharge to lagoon 1